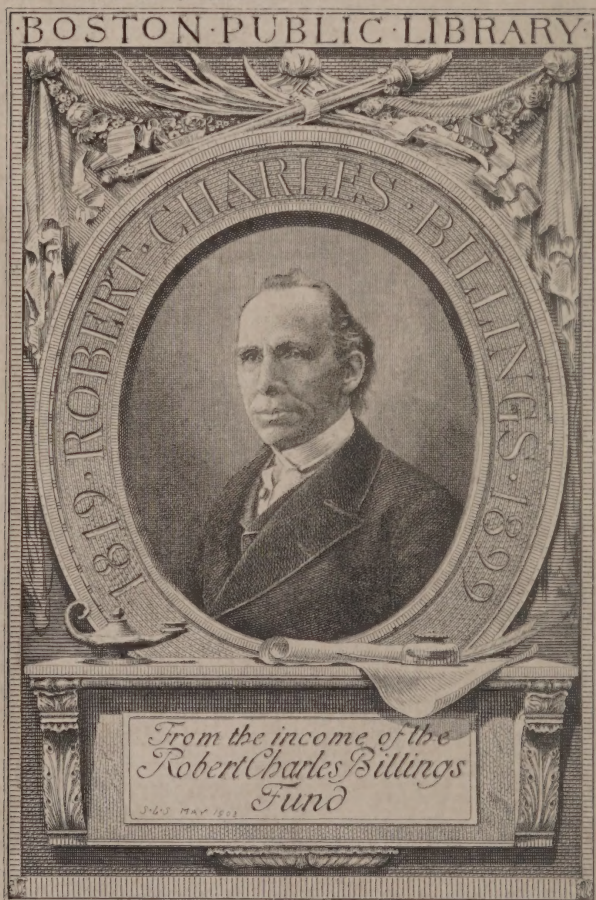


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# HOW TO KNOW THE TREES



# HOW TO KNOW THE TREES

BY  
HENRY IRVING

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# HOW TO KNOW THE TREES

HENRY IRVING

*Bellings*  
*July 27. 1910*  
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✓ Birch



# HOW TO KNOW THE TREES

## INTRODUCTION

“What we want is the meaning, the character, the expression of a tree, as a kind and as an individual.”  
—O. W. HOLMES.

THE particular trees of which the following chapters treat are such as may be commonly met with in Britain. Some are native, whilst some are of comparatively recent introduction, but these may be regarded as naturalised.

The descriptive notes are written from the standpoint of an ordinary observer whose interest is in the trees as living creatures, not for their commercial or other uses.

The illustrations selected are mainly those which shall best help in the matter of identification, and especially in the winter season, when this is beset with the more difficulty. They comprise the winter appearance of the

tree, of the twig, of the resting bud (this last enlarged somewhat so that the more minute markings, leaf-scars and leaf-traces, may be the better noted); the summer appearance of the leaves on a portion of the clothed twig; and, for any season, the appearance of the lower part of the trunk, showing also the surface and texture of the enclosing bark. These in their season, with such detailed aid as may be derived from the descriptive notes, will, it is believed, generally suffice for purposes of identification at any time in the year.

A note of warning is required in reference both to descriptions and illustrations. Trees are living creatures; they are not cast in moulds like iron palings. They are subject to many influences, hereditary and circumstantial. They have decided individuality. Variation may meet us at any point. No individual tree is true to type, at one and the same time, in every particular.

The main division of the trees here is into (1) broad-leaved trees (Beech, Oak, etc.), and (2) narrow-leaved trees (Pines,

Firs, etc.). The broad-leaved trees are again divided into (1) those with inconspicuous flowers, mostly gathered together into catkins, lacking flower-leaves (or petals), which accept in the main the service of the wind for the conveyance of the pollen dust from flower to flower ; and (2) those with conspicuous flowers, growing singly or in clusters, having petals white or coloured, secreting nectar, attractive to bees and other winged insects, to whom they look for the conveyance of the pollen as required.

It is hoped that the following notes, descriptive and photographic, will serve as aids to those who desire a closer acquaintance with our common trees ; ability to distinguish one kind from another at any season ; some knowledge of their individual character and habit ; and, added to these, the attainment of a sympathetic regard for them, through grateful appreciation of their gentle companionship and generous service.



# I

## THE BEECH

THE Beech, growing in the open, is a stately, luxuriant tree, with oval-shaped crown, and branches reaching almost to the ground. One amongst many in the forest, its stem rises as a plain column some 50 or 60 feet without a branch ; and its diminished crown, joining with those of its immediate neighbours, becomes part as of a deep canopied roof over cathedral aisles. By nature it is extremely masterful, a monopolist bred and born, persistently, as it were, staking out its claim, and holding its own against all comers. It casts so dense a shadow that few plants can grow beneath it.

In winter the Beech shows a delicate tracery of finely tapering twigs on ascending branches. In young trees, and on the lower limbs of older ones, in sheltered situations, the dry leaves of the previous summer



THE BEECH IN WINTER.



BEECH LEAVES.



TRUNK AND BARK OF BEECH.



long retain their hold, and glisten and rustle even till the new spring opens. Where the leaves have fallen, the rich bronze carpet which they make under the denuded Beeches, with the grey stems of the trees contrasting, and the long shadows stealing across, is full of warm light even in winter days.

As spring draws on, the tree, by reason of its changing buds, assumes almost a ruddy hue, to be followed by the pure emerald of the first unfolding leaves, till these attain full growth with deeper but yet translucent shadow.

With the full summer the closely-fitted mosaics of leaves, in ascending tiers, thickened and opaque, yield to the wayfarer most grateful shade as of twilight at high noon, forming under widespread expanse an oasis of coolness amid the surrounding midday swelter. For every leaf with its shining surface throws back excess of light and heat.

In autumn the peculiar glory of this tree appears when, robed about with leaves whose green is changed to ruddy gold, it

lightens the landscape as with a flame; on dull days fairly simulating sunshine, on bright days gathering in and intensifying the day's brightness.

It will be useful now to give some details as aids to identification. These, taken more or less together, according as they may be available, will serve to distinguish the Beech from other trees in any season of the year.

The trunk is cylindrical, but broadening at the base, as with prehensile claws that grip the ground, assuring firm foothold. The bark is thin and smooth, and fits like a skin over moulded trunk and limb. It is olive grey in colour, almost lustrous, with exquisite gradations of tone. The winter twigs are smooth, of varying shades of brown, distinctly zigzag, long, and slender. The resting buds, placed alternately on either side of the twig, are spindle-shaped. They stand out boldly from the twig at each angle of its zigzag. They are protected with numerous firm scales of a pale brown colour. As the bud expands, putting forth its young leaves, these scales separate and eventually fall off, as a



"THE BEECH IS A MONOPOLIST . . . STAKING OUT ITS CLAIM AND HOLDING ITS  
OWN AGAINST ALL COMERS."





A WINTER CARPET OF LEAVES UNDER BEECHES.



small brown cap. Beneath each bud on the twig is the small healed wound, the "scar," where the leaf of the previous year was attached. This in the Beech is elliptical in shape, and shows three small "traces" where the severed tubes that passed from twig to leaf have been closed.

The leaves, when first emerging, are delicately fringed with silky hairs. Later on these fringes disappear. The full-grown leaf is oval in shape, and pointed somewhat; in colour, clear dark green, and glossy. It has a slightly wavy outline. The midrib runs in continuation of the stalk direct to the apex; the side ribs branch off alternately, and run in parallel straight lines to the margin.

The pollen-bearing flowers are distinct from the fruit-producing flowers, but they appear on the same tree. They grow out at the junction of the young leaf-stalks with the new shoots. The pollen-bearing flowers are crowded together into rounded bunches, which form small clusters, hanging freely by long slender stalks. The work of these flower bunches is to produce the fine

yellow dust, or pollen, by which fertilisation is achieved. This pollen is scattered abroad by the wind, and so conveyed to the fruit-producing flowers. Their work accomplished, these bunches drop off and for a time litter the ground beneath. The fruit-producing flowers are enclosed in a green sheath having the appearance of a larger bud with short bristles attached. This grows higher up the shoot, and stands erect on a shorter stalk. When it has reached a certain stage of maturity, its two contained flowers receive and retain some of the wind-blown pollen from the myriads of pollen-bearing flower clusters. Then commences, and continues, the vital process by which eventually the mature fruit is produced. Nearly all our large trees, as we shall see, depend thus upon the wind's agency for the conveyance of the pollen from the pollen-bearing to the fruit-producing flowers.

The fruit, when ripe, is contained in a hard bristly capsule. This capsule splits open crosswise, its points bend backwards, and two three-sided nuts of a deep chestnut colour are exposed. Some of the empty capsules

often remain on the tree for a considerable time.

The only tree at all likely to be mistaken for the Beech is the Hornbeam. Points of difference will be indicated in the account of that tree.

## II

### THE OAK

THE Oak has a rounded, spreading crown. Its general character is that of sturdy endurance and strength. Estimating its age by centuries of years, in maturity it stretches out below great boughs, horizontally, in defiance of gravity, basing its semi-circular crown with almost a straight line drawn parallel to the ground. The radius of that semi-circle may be a hundred feet and more. Its supporting stem, with expanding base, is built, massive and strong, to endure alike downward pressure of solid weight and side strain from force of tempest. Smeaton was well advised in taking the stem of the Oak as his model in designing the Eddystone Lighthouse tower, against which beating wind and bombarding wave should deliver vain assault.

In winter the great branches stand out



twisted and gnarled, zigzagging in a way peculiar to and wholly characteristic of the Oak, multiplying elbows, knotting these to hardness, never flinching or failing of their purpose from their place of junction with the main stem to their clustered twigs at the extremities.

Spring opens out till most other trees are approaching full leafhood ; but the Oak, with masterly reserve, gives no sign, save by the spreading of a ruddy glow over all its surface with the brightening of its multitudinous bud-clusters. Only when the season is well assured will a closer observation show that the deepening ruddiness of the whole has come of the first thrusting forth of new twigs and tiny leaves ; a ruddiness which turns to green and gold as the tasselled catkins of the pollen-bearing flowers enlarge and droop amongst the increasing foliage.

By midsummer the tree is in full leaf. The withered pollen-bearing catkins, having done their work, litter the ground. The leaves, growing in rosettes and clusters, are bright green ; they gradually darken in tint.

Then, in the advanced summer, a new process begins. Many buds that did not open earlier now start into activity, expand, and break into leaf, so that, scattered over all the broad expanse of darkened green, are the ruddy tints and fresh brightness of young and growing leaf rosettes.

In autumn the fruits are plainly manifest, changing to ripe brownness in their green cups. The greenery of the Oak still persists, after most other trees have assumed their autumn tints and some have lost their leaves; the Oak, as it were, winning reward for spring's reserve by longer maintenance of summer's crown. Finally, the green changes to russet brown, the dried leaves for the most part retaining their position till late gales clear the twigs. But on young trees the dead leaves often stay till the new spring opens.

The trunk is, as already mentioned, columnar as a lighthouse tower, built for endurance, thicker at the base, and thickening again where the division begins and the great lower limbs project. The bark is thick and deeply furrowed, in age becoming

knotted and gnarled. It is light grey in colour, often rendered still lighter by thick growth of silvery lichen. The twigs are comparatively short and stout, usually brownish. The resting buds are spirally arranged, becoming crowded and clustered at the tips of the twigs. They are thick-set, and stand, on projecting bases, well out from the twig. They are brown in colour, showing numerous protecting scales. The scar, where the previous leaf was attached, is somewhat shield-shape, having three sets of clustered traces where the leaf-tubes have been severed.

The leaves are oval in general outline, narrowing towards the base; but the general outline is deeply indented, making six to eight well-marked, rounded divisions. The midrib passes direct to the apex; the side ribs branch alternately and pass to the farthest away curves of the divided margin of the leaf. The stalks of the leaves, if any, are very short.

The pollen-bearing and the fruit-producing flowers grow on the same tree, but are distinct. The pollen-bearing flowers

begin to emerge before the leaves, but as they expand the leaves also appear. Presently they hang down as clusters of catkins, two to three inches in length, like strings with unevenly - threaded golden beads. Later, and higher up on the young growing twig, at the junction of leaves and twig, appear the small, stiff catkins of fruit-producing flowers. These are in shape like short erect spikes, having on them from four to six projections of pinhead size, which are the flowers. The pollen is carried from the pollen-bearing flowers to the fruit-producing flowers by the wind's agency.

The well-known fruit of the Oak is the oval - shaped acorn in its embossed cup, attached, two or more, to a considerable stalk, the outgrowth of the short erect spike which carried the fruit-producing flowers. When ripe the brown fruit falls, leaving the cup still attached to the twig.

There are two varieties of the Common Oak. The one, as described above, has stalked fruit-producing flowers and stalked fruits. It is named accordingly the "Pedicunculate," or Stalked, Oak, and is the



commonest of Oaks in the Midlands and South. Its leaves are practically stalkless. The other has stalkless fruit-producing flowers and stalkless fruits ; these " sit," as it were (sessile), close down upon the twigs, and so this is distinguished as the " Sessile " Oak. Its leaves have fairly long stalks. This variety is more common in the West and North.

Some mention may be made here of the curious growths upon the Oak known as galls. These are the result of irritation caused by certain wasp-flies, which lay their eggs in various parts of the tree. The abnormal growth resulting becomes the shelter and feeding-place of the grubs till they are fully matured. One of these is the Oak " apple," so named from its likeness to that fruit, round and rosy, appearing with the early leaves. Another is the " currant " gall, attached to the drooping catkins of the pollen-bearing flowers, often several on a stalk and several stalks in a cluster, suggesting a bunch of currants. On the back of the leaves may be found others, one round and red like a cherry and so named the " cherry " gall ; others flat, rounded, brown or red,

crowded together, and known as "spangles." Another gall, which is the outgrowth from an Oak bud, is itself like a curiously enlarged bud, the appearance of which is indicated by its usual designation, "artichoke" gall. Then there is the "marble" gall, hard, green at first, changing to brown, growing, as it were, out of the substance of the twig, to which it still adheres after the fly has escaped.

There are, besides, many other kinds of Oak in cultivation. Two only of these need here be briefly described, and their details set forth in comparison with those of the Common Oak. They are the Turkey Oak and the Holm Oak, trees which, though rarer, are yet not unfrequently to be met with in parks or gardens.

*The Turkey Oak.*—The Turkey Oak is also known as the "mossy-cupped" Oak, from its very distinctive fruit-cup. This tree has the general characteristics of the Common Oak, but its tendency is to grow more uniformly upright rather than spreading. Its branches are less twisted, its twigs longer. Its bark is darker in colour. Its

buds are more pointed, and have often, especially the terminal ones, attached to them thread-like appendages, the remains of certain leaf-like growths (stipules), from the previous season. Its leaf-scars are smaller, elliptical in shape, showing five to seven small leaf-traces, not grouped as with the Common Oak, but extended in a curved line. Its leaves are stalked, as are those of the Sessile Oak. The leaf-margins are more deeply and sharply divided, often cut, as it were, down almost to the midrib, with the appearance of having been snipped away. Its flowers are similar to those of the Common Oak, but the pollen-bearing catkins are longer and more conspicuous. Its fruit, which scarcely grows at all during the first season, but remains a tufted bud till the following spring, must thus be looked for on the wood of the previous year. In the new summer it grows its "mossy" cup, which, sitting firmly on the twig, has the appearance of a doll's pin-cushion. Later, the point of the enclosed fruit emerges out of the centre of the cushion, grows out to a full-sized acorn, ripens to brownness, and falls.

*The Holm Oak.*—The Holm or Holly Oak is a smaller tree and evergreen, rounded, somewhat bush-like in appearance. Its leaves are thick and tough, dark green above, lighter beneath, oval in outline, often toothed, and shaped more or less like those of the Holly. They are spirally arranged on the twigs, and remain attached during two seasons, falling in the spring time. Flowers and fruits are much like those of the Common Oak, except that the pollen-bearing flowers are lighter in colour, and hang in shorter clusters; the fruits are relatively longer and sharply pointed, and so fully enclosed within the tightly-fitting cups that little more than their tips emerge.



### III

#### THE BIRCH

THE slender grace of the Silver Birch impresses everyone. Few of our trees are so well loved. Coleridge's descriptive title, "Lady of the Woods," meets with instant approval. Yet, perhaps, the limiting word of that description scarcely holds. If the "Lady" Birch loves the woods, she loves the open daylight better. Left to her own devices she will be found more often fringing the forest, where are free air and sunshine, than languishing within its confined shadows. For, indeed, the Birch loves most the open spaces, breezy uplands amongst the bracken and heather, even the higher mountain slopes whither the Scots Pine will scarcely venture. That slender grace of the "Lady" Birch is associated with a splendid hardihood, and power of adaptation, unattained by sterner-seeming trees. Loving thus the open

air and the unshaded light, the Birch is, by these, nurtured to the utmost refinement of enduring tenderness.

We have in Britain two chief varieties of Birch, which, amongst other distinctions, may be most readily recognised by the habit of their terminal twigs. The one, the Common Birch, has these spreading, or erect; the other, the White Birch, has them drooping, and sometimes in long festoons.

In winter the slender grace of the Birch is perhaps most apparent. Its darker twigs gleam in the sunshine, giving emphasis to the clear white of the central stem. Seen, as these trees often may be, marking the margin of a Pine wood, they spread there a subdued light which, like atmospheric haze, softens the dark masses of the trees behind. But it is when seen against the sky, with a depth of unbroken blue or rounded mass of sun-lighted cumulus cloud for background, that the individual grace of this tree most appears. Then the rich tracery of its curved branchings is fully revealed in glistening bronze—outflowing, tapering to utmost fineness, intermingled but never



LIGHT-LOVING BIRCHES FRINGING A PINE WOOD.



COMMON BIRCH IN WINTER.



involved, tingling with life to the farthest fibre, scarcely less evident in this its winter's "beauty" sleep than in the coming spring's awakening.

In spring the newly unfolded leaves spread themselves out, or droop half-pendulous, according to the inclination of the twigs, overspreading like a green mist. Crowds of catkins, brown changing to yellow, hang and quiver in front of the dainty leaves.

In summer the catkins have disappeared, the leaves have darkened in colour on the upper surface and have become more tremulous, moving with the slightest breath of wind, so lightly poised are they, scattering scintillations of light. George Meredith in "The Egoist" gives the following word-picture of the tree, which is inimitable in its beauty and descriptive fullness: "See the Silver Birch in a breeze; here it swells, there it scatters, and it is puffed to a round, and it streams like a pennon, and now gives the glimpse and shine of the white stem's line within, now hurries over it, denying that it was visible, with a chatter along the sweeping folds, while still the white peeps through."

In autumn the tree again shows crowds of catkins, more hidden away among the leaves than were those of spring. These are fruit-catkins ranged along the twigs, pendulous, ripening to dryness among the yellowing leaves, which they outlast, remaining more or less the winter through.

The distinctive bark of the Birch is thin and silver white, with thin, dark lines running transversely, and occasional rough, dark patches. Flakes of this bark are shed from time to time, peeling off like paper in the direction of the transverse lines; thus new bark, like finest woven silk, is constantly exposed, and the silvery whiteness is maintained from year to year. But in some trees the silvery whiteness gives place to a golden brown; whilst in those with the pendulous branch-tips the bark at the base for several feet becomes rough, very corky, with deep fissures.

The winter twigs are bronze-coloured, smooth on the pendulous variety, slightly hairy on that with spreading branch-tips.

The resting buds are arranged spirally on the twigs. They are somewhat spindle-

shaped, shorter, and in proportion stouter, than those of the Beech, enclosed in reddish-brown scales, and pressed towards the twig. The leaf-scars are small, half-oval in shape, and show three tiny leaf-traces. The leaves vary, but in the main are triangular, often with an extended sharp point at the apex. Their margin shows wide serrations, with smaller ones intervening. Their colour is deep green, rather shiny above, paler below, slightly translucent. The change in autumn is to yellow, orange and brown. The midrib runs direct to the apex, the side ribs branch right and left, and terminate in the larger serrations at the margin. The stalks of the leaves are comparatively long, about half as long as the midrib, and give a delicate poise. The leaves scarcely hide the tree's framework, and cast but a slight shadow.

The flowers, pollen-bearing and fruit-producing, are separate, but to be found on the same tree. They are both crowded into cylindrical catkins. The pollen-bearing catkins make their appearance in August, and remain in position all the winter through, stiffly erect in relation to the twigs which

they terminate. In the spring they elongate, and fall over, hanging loosely pendulous, ready for the wind to shake out and scatter their pollen dust. All through the winter the fruit-producing catkins are safely packed away in the lateral buds of the twigs, and emerge erect with the leaves in the spring.

The fruit still has the appearance of a catkin, for the erect flower-catkin, lengthening slightly, has turned itself, pointing downwards. It now suggests a stiffish rounded tassel of threaded discs, though these discs are really elongated scales, with wings so arranged that their combined edges become circular. When fully ripe, well on in the winter, these scales drop off, setting free the tiny seeds, and leaving exposed the central stalk, or thread, of the catkin, which remains long on the twig. The seeds have two round, transparent wings, or sails, presenting considerable surface to the wind, by which their dispersal is secured.

A rather frequent gall found on this tree is that caused by the Birch gall mite, a similar insect to that which affects so disastrously the Black Currant buds in our gardens.



The buds infested by this mite either do not open, or expand irregularly.

Another abnormal growth, and one that is peculiarly disfiguring to this tree, is that known commonly as "The Witch's Broom," a crowd of short twigs inextricably involved and massed, which grow eventually to a great size. By some this is said to be the result of the tree's efforts against the crippling action of the gall mites referred to; but it is also explained as due to similar efforts against the mischievous ramifications of a minute fungus.

## IV

### THE HORNBEAM

THE Hornbeam stands in sharp contrast to the Birch. In its younger stages, at least, it well endures, if it does not show a preference for, shade. It casts heavy shadows, and against the delicate grace of the Birch it appears almost ungainly. Breaking into branches generally rather low down, these rise stiff and spreading in a way that would seem to justify the description "cabbage headed." Yet the Hornbeam has a character of its own which is distinctly interesting; and, at certain seasons, a beauty which on its own lines is unsurpassed. Unfortunately the tree has endured much hard treatment in the past, for its wood proved very serviceable for the cottagers' fires. Where Hornbeams abound, as in Epping Forest, every tree has been roughly pollarded and all character lost. When allowed to

live its own free life, it has much in common with the Beech, which, in fact, it so resembles in many features that it has doubtless often been mistaken for that tree by the casually observant; hence its reputation for being more rare than it is.

In winter its long ascending branches should be noted. In some situations and seasons its dried brown leaves still remain attached, as do those of the Beech; and, longer still than these, the ripe fruit clusters.

In spring, when its full-grown multiplied catkins of pollen-bearing flowers clothe the whole tree, whilst the young leaves are yet small and inconspicuous, the Hornbeam presents, perhaps, its loveliest appearance, adorned as it were with tassels of silver and tinsel of fine gold, shimmering in the sunshine.

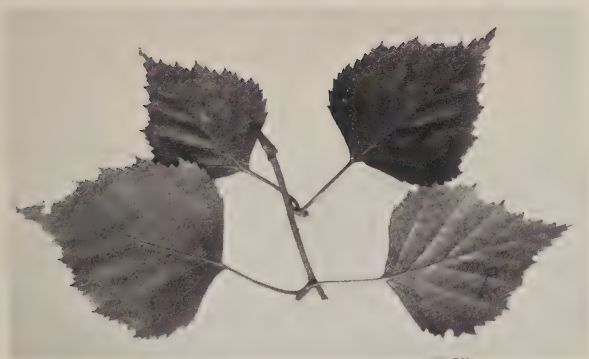
In summer, with leaves fully expanded and so spread, as with the Beech, to intercept every possible light-ray, it shows dense masses of foliage of a rich deep green, but less reflective of light than that of the Beech.

In autumn the first effect of the growing

fruit-clusters is to make the foliage appear still more dense as fruit and foliage blend together. Later, the foliage thins somewhat, but the lengthened fruit-tassels, expanding their full-grown wings, fill up vacant spaces. Later still, when foliage and fruit change to yellow and then to russet brown, the tree has yet another beauty ; and this it may hold, more or less, well on into full winter days.

The trunk is cylindrical, like that of the Beech, but, in distinction from that tree, is fluted as though a number of lesser stems had coalesced. But this fluting is not always very apparent until the tree has attained a good age. The bark, also like that of the Beech, is thin and smooth, and grey in colour. But here, again, is considerable variation, probably resulting from difference of soil and situation ; it also roughens with age. The winter twigs are not so smooth as those of the Beech, but slightly hairy, and less zigzag. The resting buds are placed alternately on the twig ; they are somewhat flattened, and pressed up against the twig. They show numerous scales. Leaf-scars are crescent-





BIRCH LEAVES.



TRUNK AND BARK OF HORNBEAM.



HORNBEAM IN EARLY SPRING.

shaped, with three small "traces" of the severed tubes. The leaves are oval and pointed like those of the Beech, but their dark green is without gloss, and their margins are doubly serrated throughout. They are slightly "gimped," and this gives them an apparently wavy outline. The midrib runs direct to the apex, and the side ribs (twelve to fourteen pairs of them) in parallel straight lines terminate in the larger serrations at the margin.

The pollen-bearing and fruit-producing flowers are distinct, but grow on the same tree. They are grouped into pendulous catkins and appear with the leaves. The catkins of pollen-bearing flowers grow out from lateral buds on the last season's twigs, and terminate short new shoots. The catkins of fruit-producing flowers grow out from lateral buds nearer the tip of the twig, and from the terminal bud itself. They are more loosely constructed, pale green in colour, with leaf-like pointed scales which curve backwards. The pollen is conveyed by the wind. The clustered fruit hangs in long tassels, something like those of the Sycamore ;

but here a curious leaf-like appendage, forming a kind of triple wing, to which two corn-like fruits are attached, takes the place of the double wing of the Sycamore, and answers a like purpose, aiding dispersal by the wind.

The following table gives the permanent and easily recognisable distinctions between the Beech and the Hornbeam, ignoring those which are peculiarly subject to variations in the habits of both trees.

	BEECH.	HORNBEAM.
To distinguish by buds.	Long, spindle-shaped; project boldly from twig.	Short, thickened, angular; pressed up to twig.
To distinguish by leaves.	When young, fringed with silky hairs; without visible serrations; polished surface; 8-10 pairs of side ribs.	No silky fringes; doubly serrated matt surface; 12-14 pairs of side ribs.
To distinguish by flowers.	In rounded clusters.	In pendulous catkins.
To distinguish by fruit.	Two triangular nuts in a bristly capsule.	Long drooping clusters, with distended triple wings, to which two corn-like fruits are attached.





LEAVES OF HORNBEAM.



TRUNK AND BARK OF SWEET CHESTNUT.



RESTING BUD  
( ENLARGED )  
OF SWEET  
CHESTNUT.



WINTER TWIG  
OF  
HORNBEAM.



SWEET CHESTNUT LEAVES.



WINTER TWIG  
OF SWEET  
CHESTNUT.

## V

### THE SWEET CHESTNUT

WE are compelled to conform to common usage in speaking of this tree as the Sweet Chestnut, as though it and the Horse Chestnut were in some way allied ; whereas they are not even distantly related. Except for the single fact that their fruits (though one is a fruit and the other a seed) are somewhat similar in outward appearance, they differ in every possible particular. This is *the* Chestnut, whatever the Horse Chestnut may be. Native to the sunny South lands, it is said to have been brought here by the Romans ; so it has had time to make itself fairly at home. Yet it is chiefly to be found in planted parks and not in our wild woods. It is, however, much used as undergrowth to form cover for game.

In force of character the Chestnut is a close rival of the Oak. Growing more

erect, it, nevertheless, gives a similar impression of sturdy strength. There is something gladiatorial in its pose and bearing. Firm-set, erect, massive, muscular, it were no very far flight to imagine a readiness to give, or take, a blow, or throw.

In winter the sturdy column of the central stem is seen to taper little to a considerable height. It bears comparatively short but heavy branches, which follow a like habit. These are carried horizontally, as on the Oak. They dip more at the extremities, and are retained generally at a lower level, often sweeping the ground. The smaller branchings from these have a drooping tendency, which may be compared to falling drapery from an extended arm.

In spring the first colour of the young leaves, spreading over the surface of the tree, is ruddy. This soon gives place to a clear, deep green. Not till late spring, or even early summer, do the catkins mature. Then the whole tree glows from lowest branch to summit with stars as of pale gold, radiant.

In summer the general effect is massive,



with rounded mounds of foliage completely covering and hiding, as with a thick mantle, the sturdy limbs. This foliage is deep green in colour, but is relieved by light reflections from the bright leaf-surfaces.

In autumn the colour changes to lemon yellow, deepening to gold, and then to dull brown in the fall, which takes place earlier than with the Oak and Beech ; but beneath the Chestnut is no rich glistening carpet of leaves, only dull, sodden brown.

The trunk is columnar, tapering a little, and upstanding to the summit. The bark is thick and deeply furrowed. The furrows are longitudinally placed, but in age tend to twist, presenting sometimes the appearance as of thick strands in a great cable. The colour is dark grey. The winter twigs are brown, stiff, angular, with strongly defined ridges passing upwards as though to support the prominent leaf cushions, above which, as upon brackets, the resting buds are placed, though somewhat awry in relation to the leaf-scars. The resting buds are yellowish green changing to red, thick-set like those of the Oak, but show only two

outer scales. They are arranged alternately on the twig, but on erect shoots the arrangement becomes spiral. The leaf-scar is triangular, with angles rounded off, and shows usually three groups of leaf-traces. The leaves are large, seven to nine inches long, narrow in relation to their length, and tapering to a point at each end. They have decided teeth at regular short intervals all round, these having a forward direction like those of a "rip" saw. The midrib is in continuance of the stalk to the apex, with ribs on either side (about twenty pairs of them), each ending in a sharp tooth at the margin.

The flowers are arranged in catkins, of which there are two kinds, both found on the same tree. These are simple catkins with pollen-bearing flowers only, and mixed catkins with both pollen-bearing and fruit-producing flowers. Both stand erect, appearing at the junction of leaf-stalk and twig of the current year. They do not mature till the leaves are fully grown. Arranged more or less spirally on the twigs, they radiate as stars when seen from a distance. Examined separately, each

emerges from among the shield-like leaves as a glittering lance-head exquisitely poised. The catkins with pollen-bearing flowers only grow lower down the twig, and mature first, putting out their many stamens from the base upwards. The mixed catkins grow near the tips of the shoots, and carry pollen-bearing flowers on the upper four-fifths of their length. On the lower one-fifth are two or three green rosettes with creamy threads protruding. These are the fruit-producing flowers. The pollen is conveyed from flower to flower mainly by the wind, but also to some extent by the visitation of numerous small insects which find the catkins in some way attractive to them, though the flowers secrete no nectar.

The fruit is enclosed in a casket which presents the appearance of a diminutive hedgehog on the defensive, with sharp spines projecting every way. When ripe this casket splits open crosswise, exposing the brown nuts. In this country, as a rule, not more than one in each of these clusters of nuts matures. They are then roundish, drawn up to a point, something

like a bag of which the strings have been tightly drawn to close it when full. Those that fail to mature are like similar bags, but empty, with their sides pressed together. At the top of each nut stands erect a little tuft, the remains of the stigmas from the time of flowering.



## VI

### THE ALDER

THE Alder is the guardian of the water-meadows. Its matted roots bind the river banks against erosion ; its ranked stems march with the stream ; its deep green, glistening, and long-lasting foliage provides long succession of cool retreats by shaded pools. Occasionally it may be found standing back somewhat, growing by a single stem into a well-proportioned tree of moderate size ; but its general habit is to fling up from the water margin a series of strong stems, outspreading, and bush-like. Thus grouped and multiplied, it marks the course of the stream winding through the meadows ; or bounds the waters of the mere, shade meeting shade in the reflection of quiet waters. For as there is no tree—not even its contrasting companion the Willow—that loves better the moist places, and

the moist atmosphere over these, so no tree looks more at home, or fares better there. It seems to be equally content in the savage glens and ravines of the Highlands, and in our soft lowland meadows.

In winter its twigs are never wholly bare. Its multitude of little groups of cone-like fruits, now gaping open, its even more numerous tightly closed, clustered cylinders—the flower-catkins that are to be—give to the leafless tree a partly clothed appearance. And as these young catkins are already richly coloured, reddish brown to crimson, they impart a warm glow to the maze of twigs in the winter sunshine.

In spring the old cones are still there. The catkins of the pollen-bearing flowers elongate almost as early as those of the Hazel, and hang pendulous, covering the tree, as with living mantle of bronze, some weeks before there is the least sign of the later greenery.

In summer its deep green foliage, gathered into full masses, affords strongest contrast to the light filminess of that of its companion Willows, suggestive of cool shade, some-



ALDERS: "SHADE MEETING SHADE IN THE  
REFLECTION OF QUIET WATERS."



TRUNK AND BARK OF ALDER.



ALDER IN WINTER.



what dull and slumberous through days of cloud and gloom, but awakening and twinkling in sunshine.

In autumn the leaves merely darken still more, getting a touch of sombreness before their fall, which occurs later than with most, for the Alders are still green when many other trees are glowing in orange and gold, and some even bare. Already are present, hidden away among the leaves, the young flower-catkins in preparation for the following early spring-time.

The stem, if divided, raises its separate members direct from the soil of the river bank. The bark is dark in colour, furrowed and scaly. The winter twigs are brown, triangular in section, as are also the resting buds. These are placed spirally on prominent bosses, with supporting stays passing down the twig. They are all but enclosed in a single scale, and for further protection are coated with a light waxy "bloom." They are distinctly stalked, a unique peculiarity of the Alder among our trees; though there is some suggestion of stalks to the buds of the Wayfaring Tree. Here we get

a reminder of the fact that these and all buds are, in reality, the first beginnings of branches, that they would be more correctly thought of as cradled twigs than as cradled leaves. That the buds of the Alder are truly stalked may be seen from the position of the leaf-scar, at the base of the stalk. Buds which on many trees terminate dwarf shoots have the appearance of being stalked, notably on the Beech, but in these the scar will be found just under the bud on the top of the stalk, whilst the stalk below will show a series of crowded scars. There are no such scars on the stalk of an Alder bud. The leaf-scars at the base of the bud-stalks of the Alder are heart-shaped (sometimes rhomboid), and show from three to five leaf-traces.

The leaves are rounded, tending to egg or heart shape, with a broad, often deeply notched apex. They are of a deep shining green, and when young are somewhat sticky. The margin is cut into irregular teeth. The midrib passes direct to the apex, with five to seven pairs of side ribs to the margin.

The pollen-bearing and fruit-producing

flowers are separate, but grow on the same tree. As already stated, they may be found, in their preliminary stages, in the preceding autumn, and are exposed all through the winter. Till February they are stiff cylinders, richly coloured, brown to crimson. The pollen-bearing flower cylinders then expand, hang down loose and pendulous, a beautiful bronze, casting their pollen on the winds. The smaller stiff cylinders of the fruit-producing flowers grow in stalked groups of three to seven, and already have the appearance of tiny reddish cones. In process of transformation these enlarge on lengthening stalks, and become still more cone-like, woody and green, the size of beans.

The fruit is contained in this woody, cone-like receptacle, the hard scales of which gape open later to set it free. It is then carried by the wind, or floats upon the water, seeking right conditions for growth. But the hard, gaping cones will be found on the tree for many months to come.

## VII

### THE HAZEL

WITH us the Hazel is seldom allowed to grow into a tree. Found usually in our hedgerows, where it is frequently hacked and clipped, or as undergrowth in the coppice, where it is systematically cut down to the stool, it has little chance of attaining size or proportion. Nor, indeed, does it evince any marked desire or aptitude in that direction, but rather the reverse. It prefers to maintain itself on a number of stems, and is continually throwing up fresh ones in the shape of strong stool and root suckers. So it must be regarded as a tree that, for reasons of its own, has chosen to adopt the habit of a bush, and best prospers so. We noted a similar tendency in the Alder, and shall find some other trees adopting more or less a like habit.

In winter should be noted the immature

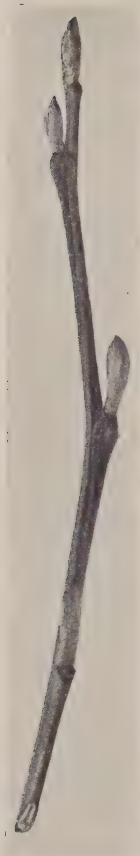




ALDER LEAVES.



YOUNG CATKINS AND OPEN CONES OF ALDER  
TWIG IN WINTER, ALSO SEEDS.



WINTER TWIG  
OF ALDER.



RESTING BUD  
(ENLARGED)  
OF ALDER.



RESTING BUD  
(ENLARGED)  
OF HAZEL.



HAZEL, LEAVES.



WINTER TWIG  
OF HAZEL.

pollen-bearing catkins, stiff brown cylinders, slightly curved, in groups of two or more, growing mostly along the sides of the twigs. For the Hazel, like the Alder, makes preparation for the earliest possible flowering; but the Hazel is in the greater hurry. A day or two of warm sunshine in January, and even in December, will often cause one or more of the stiff cylinders to lengthen out and hang down yellow with pollen as if eagerly anticipant of spring.

When spring really comes these yellow catkins are abundant. The Hazel then has all its pennons out in welcome, and they make a goodly show. Now must be looked for the little crimson flame crests on many of the side buds, tiny but brilliant bits of colour, the only outward manifestation that the fruit-producing flowers choose to make. The leaves do not put in an appearance till considerably later.

In summer the broad leaves extend themselves in open layers on the spreading branches; and, if under partial shade as undergrowth in an Oak wood, it is interesting to note with what purposed skill each

layer of foliage secures the utmost of available light. Now should be watched the gradual uplifting from the twig of the young fruits, rising out of stalkless buds to stalked clusters with attendant leaves.

In autumn the foliage changes to yellow and rusty brown, and the light green nuts in their frilled mantles assume their characteristic nut-brown tint.

The bark on the stems is smooth. The winter twigs are brown and decidedly hairy. The resting buds are rounded, somewhat blunt, and flattened on the outer surface. They stand out from the twig on rather prominent bases, are greenish to brown in colour, and show several protecting scales. They are arranged alternately on the twigs, but spirally on the erect suckers. The leaf-scars are almost semi-circular, with three leaf-traces.

The leaves are softly downy when young, but later become somewhat coarse and hairless. They are rounded, or broadly oval, with a suddenly elongated point at the apex ; those on the suckers may show three such extensions. The margins are broken up into

large teeth edged with smaller ones. There is one midrib, with pairs of side ribs branching out from it. The short leaf-stalks are covered with glandular hairs that secrete a sticky substance perceptible to the touch. The flowers, pollen-bearing and fruit-producing, are separate, but to be found on the same tree. The pollen-bearing flowers, as already stated, are exposed through the winter as stiff, and short, brownish cylinders, growing, as spring approaches, into long, pendulous yellow catkins in clusters. The fruit-producing flowers are enclosed in buds, slightly more rounded than the leaf buds, till in the spring they thrust forth their tiny crimson plumes. So they wait, receptive, for the wind-scattered pollen. Some weeks later the leaves unfold; then each flower bud starts into growth, producing eventually a stalk, with leaves, and clustered fruit.

The fruit is, of course, the typical nut with its scalloped husk, hard brown shell, and nutritious kernel. These nuts are so assiduously collected and planted by the squirrels, though for quite other purposes, that these lively little creatures may be said



to be the main instruments in the dispersal of the seeds.

There is a Hazel gall-mite, similar to that which infests the Birch, which produces rounded swollen buds that never properly open. There is also a nut weevil, a small brown beetle with a long snout, which inserts its egg into the young nut, and this develops into the fat maggot so often found in place of the sweet kernel.



THE HAZEL'S WELCOME TO THE SPRING.



THE HAZEL IN SUMMER.



## VIII

### THE PLANE

ABUNDANT as the Plane tree now is with us, it is of comparatively recent introduction. It has never lost its foreign, almost Oriental, air. We can scarcely be too grateful for the bounteous brightening greenery it uplifts in the ways and squares of our cities, where it holds its own in spite of vitiated air and clogging impurities. It lives, and fairly thrives, and little abates its sunshiny suggestiveness, its Orient fullness, splashing here and there golden gleams over drab streets ; in stifling August heat casting cooler shade that by contrast is refreshing. Yet the tree is un-English, with its speckled trunk and limbs, its broad geometrical leaves, its curious dangling flowers and fruits, its billowy massed crown. It is with us pre-eminently the city tree—city and suburban—and by it city and suburb are so far

redeemed ; but it seems rather out of place in our country-side, and strikes an alien note in our English landscape.

In winter the appearance of the tree is distinct and characteristic. Its central stem rises often to the summit, but from it are thrust out large elbowed branches of varied lengths, which follow no very definite plan, so that the tree's form is decidedly lacking in symmetry. The speckled appearance of the trunk and limbs is then most noticeable, as it is at this season that the bark flakes off, leaving light yellow patches on the darker ground, a kind of reversed leopard's spotting. All through the winter its globular clusters of fruit, grouped on pliant stalks, dangle in crowds among the twigs.

In spring the buds are rather late in opening, but when the foliage does appear it is soon full and golden. At the same time the globular groups of flowers on slender hanging stalks, similar in appearance and habit to the still dangling fruits of the previous season, grow out from among the expanding leaves.

In summer the rounded masses of broad-spreading, semi-opaque leaves suggest and



afford ample and welcome shade. The ripened fruits of the former season have now vanished, and the pollen-bearing flowers also, but the new fruit-globes on their slender stalks are growing apace, so the succession of these may be maintained through autumn and winter to the new growths of another spring-time.

In autumn the leaves change to yellow and orange, or reddish brown. They fall late, exposing fully the dangling fruit clusters.

The trunk is round, smooth, and well sustained. In age it often becomes roughened, and heavily warted at the base. The bark is thin and unwrinkled, naturally somewhat greyish but darkened, if not blackened, by the city's smoke. Here it is that the distinguishing habit of the Plane is so marked and beneficial. The thin bark scales off in patches, exposing the new yellow under-bark, so ridding the tree of the accumulated impurities of city life.

The winter twig is rounded, slightly zigzag, and olive green in colour. The buds are arranged alternately on the twig; they project, are conical in shape, and are

protected by a single brown scale which forms a complete sheath. These buds through all the period of their growth are hidden in the bases of the leaf-stalks, and are exposed to view only by the fall of the leaves. In consequence the scar left by the fallen leaf is circular, all but surrounding the base of the bud. It has a sinuous outline, and shows five groups of leaf-traces.

The leaves vary considerably, even upon the same tree. They are large, wide-spreading, and markedly geometrical. They have deeply cut margins, forming generally five main divisions, each again cut into by smaller indentations. Instead of a single midrib, as with every tree previously considered, the Plane leaf has three main ribs, radiating from the point where the stalk enters the leaf, and terminating in the apexes of the three central main divisions. The two remaining main divisions of the leaf are supported by strong ribs branching outwards from near the base of the two outermost main ribs. So the leaf is only approximately of the five-fingered type. Golden when they first appear, these leaves soon

acquire their permanent tint of vivid green. Their firm, smooth texture ensures that every passing rain-shower shall wash away impurities, so they are able to breathe and thrive, and continue clean and bright, in positions where most other leafage becomes soot-soiled and choked.

The flowers, pollen-bearing and fruit-producing, are found on the same tree. These appear with the leaves, growing from the tips of new dwarf shoots, both kinds, as globular clusters, being attached to long slender stalks. The pollen-bearing clusters are greenish, changing to yellow as the pollen matures. The fruit-producing clusters are readily distinguished by their numerous purple-tipped spines, to which the wind carries the needed pollen.

The fruits grow into hard, roughened balls, composed of a multitude of wedge-shaped little nuts. From the thick, rounded head of each little nut projects a short, stiff spine, curved at the point. From one to four of these balls, or "buttons," as Americans name them, grow attached to a single, long, flexible stalk. As already stated,

these remain on the tree till spring is well advanced, when the small nuts begin to separate. Each, as it emerges from the cluster, displays a circle of golden hairs arranged and expanded parachute-wise on the inner tip of the wedge-shaped nut. The expansion of these hairs thrusts the nut out from the cluster, and the parachute arrangement sends them sailing down the wind and ensures a wider scattering. The stalks, too, which sustain these fruiting balls from autumn to spring, gradually disintegrate, weather-worn, and become merely ragged fibres that barely support the weight of the ripened nut clusters; so that, where these have not already been separately dispersed, they fall in mass about the time that the leaves and flowers have reached maturity.

Two main varieties of *Planes* are distinguished—the Eastern and the Western. The Western *Plane* is the “Button-wood” tree of the Americans. The differences between these varieties are but slight. Most of our *Planes* are of the Eastern variety; the Western is seldom met with in Britain. Perhaps the commonest of all with us is



that specified as "Maple-leaved," and very generally as "the London Plane." It approximates to the Western type, though it is usually regarded as a hybrid between the Eastern and the Western. Its chief tendency is to have fewer and less decided leaf divisions than the Eastern Plane, and one, or at the most two, spherical fruit clusters attached to a single stalk.

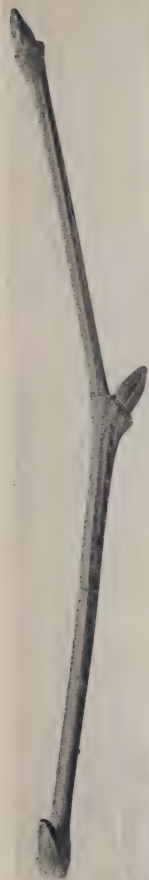
In distinguishing the Planes from the Sycamore and other Maples, it is enough to note the speckled bark and the alternate bud (and consequently leaf) arrangement of the Plane; also, particularly, the hiding of the bud in the base of the leaf-stalk, or, when the leaf has fallen and the bud is exposed to view, the circular leaf-scar that surrounds it. The Plane's globular clusters of flowers and fruits on hanging stalks also are conclusive as to its identity.

## IX

### THE WALNUT

THIS tree grows to a considerable size, and is both handsome and picturesque. It has marked dignity. From the time of the ancient Greeks, it has been distinguished by the epithet "kingly." Its fruit, also, has been ever greatly esteemed. With us the Walnut is mainly a tree of the planted park or garden, though here and there it may be found ranking with the trees of the wayside, as in the green lanes of North Devon in the neighbourhood of Porlock. This might have been more general but for the demands made upon its timber for the manufacture of gun-stocks in the time of the Napoleonic wars. It is a distinctive feature in any landscape where it occurs.

In winter, silhouetted against the sky, it is one of the cleanest of our trees, being entirely bare of everything save buds.



LEAVES OF THE PLANE.



LEAF AND BUD OF PLANE.

Showing how the base of the leaf-stalk forms a protective sheath for the bud.

WINTER TWIG AND RESTING  
BUD (ENLARGED) OF  
PLANE.



WALNUT IN WINTER.

Dividing into branches rather low down, it throws these outward and upward with a superb gesture. These branches again divide and subdivide with infinitude of graceful curvature.

In spring its leaves expand russet-tinted, and at the same time its green, handsome, pollen-bearing catkins grow out and elongate.

In summer its massed foliage, yellowish green, in multiplied subdivision, completely clothes the tree's framework, forming a symmetrical crown, rounded and dense, and affording a pleasant contrast amongst the greens of this season.

In autumn the round, green fruits become evident in small clusters of two or three at the tips of the twigs. Then the leaves slowly assume their yellow to brownish fading tints, the fruits at the same time browning to ripeness.

The trunk is strong and round, but usually is short, and divides low down. The bark is whitish grey, roughened often into distinctly lattice-shaped markings.

The winter twigs are smooth and shining,



grey to brown in colour, cylindrical, and rather stout. A distinctive peculiarity of these is that the pith is not continuous, but consists of a series of thin plates dividing the otherwise hollow tube into a number of cells, or chambers, which can be exposed by splitting the twig lengthwise. These twigs externally bear some resemblance to those of the Ash, but they can at once be recognised in that the resting buds of the Walnut are arranged spirally and not in opposite pairs. The buds are thick and rounded, dark in colour, and protected almost entirely by two scales. They stand out on prominent bases. The leaf-scars are saddle-shaped, showing three groups of leaf-traces.

The leaves are not simple, as are those of all the trees previously considered, but compound. That is to say, each leaf consists of a number of simple leaflets. There are from two to four pairs of these leaflets, arranged on opposite sides of a central stalk, which terminates in an added leaflet. The veining of the compound leaf so composed is the same in character as that of the simple

leaves already considered—a midrib with branching pairs of side ribs. Here, however, the midrib of the Walnut's compound leaf takes the character of a central stalk, which terminates at the apex of the uppermost single leaflet; whilst each separate side rib, branching from the central stalk, becomes the midrib of a separate leaflet, itself having numerous pairs of side ribs. A marked peculiarity of these side ribs in the leaflets of the Walnut is that they do not terminate in the margin, but curve over like a whip-lash, looping each into the next. The shape of each leaflet is oval, somewhat pointed, and without marginal indentations. The compound leaf of the Ash is similar in nearly every respect to that of the Walnut, but the leaflets of the Ash are more sharply pointed, and their margins are distinctly and evenly serrated. Walnut leaves are strongly aromatic, especially when crushed.

The flowers are separate, but grow on the same tree. They appear with the leaves. The pollen-bearing flowers are gathered into a stout, pendulous, green catkin, growing singly from a lateral bud on the previous

year's shoot, unattended with foliage leaves. The terminal bud of the same shoot grows out at the same time into a new shoot bearing foliage, and itself probably terminates with a small cluster of from two to five of the fruit-producing flowers. These are globular, green, bud-like, and erect, each with a pair of purplish plumes, the receptive stigmas waiting for the wind-blown pollen from the pendulous catkins.

The fruits also grow in clusters, usually two or three, at the tips of the current year's shoots. They are oval in shape, smooth, and in colour green, changing to brown. The Walnut fruit is not a nut, but a stone fruit, the outer, fleshy layer of which has not acquired edible qualities, as in the case of the Plum or the Cherry. When ripe this outer layer splits open irregularly, exposing the "stone," with its hard, bivalve shell protecting the curiously wrinkled twin kernels, held in so high esteem as sweet and nutritious, though by us scarcely regarded as of such superlative worth as to justify the old name "*Juglans*"—the fruit of Jove.



AGED ROADSIDE WALNUT TREE IN NORTH DEVON.



TRUNK AND BARK OF WALNUT.





WINTER TWIG  
OF WALNUT.



RESTING BUD (ENLARGED)  
OF WALNUT.



LEAF OF WALNUT, DIVIDED INTO NINE  
LEAFLETS.



## X

### THE MULBERRY

THE Mulberry is but a small tree. Its associations are aristocratic. The presence of a Mulberry tree on the lawn, so it is said, is itself a patent of nobility. This tree is usually found in grounds that are, or have been, attached to "stately homes." Specimens survive from far-away times, venerable with age and reminiscent of courtly dignity. Some of these, as at Syon House, date back to pre-Reformation times, marking the site of some ancient monastic institution long since put to other uses. Many that still survive were planted in the time of James I., who made great efforts to bring about their general introduction with a view to the establishment of the silk industry here. Planting the Mulberry, therefore, became in his and succeeding reigns a matter of courtly fashion, sedulously observed by courtier

nobles. So our courtly Shakespeare followed suit in his garden at New Place, Stratford-on-Avon, though both house and tree fell later under the hand of the vandal. Yet cuttings were struck from this tree which afterwards flourished, and a small specimen in direct descent may be seen in the Royal Gardens at Kew. In this connection it may be remembered that Milton also planted a Mulberry tree, which still survives, in the grounds of Christ's College, Cambridge.

Two kinds of Mulberry tree are found—the Black and the White. The Black Mulberry is the hardier and best suited to our English climate. Indeed, it flourishes well even in the smoke of the town. Mulberry trees annually bear fruit in the heart of London, as in the Charterhouse gardens and in Finsbury Circus. The main differences between the two kinds of Mulberry are in the colour and texture of the leaves and the fruit.

In winter the Mulberry shows sturdy branches, which commence rather low down, the lower ones often showing a tendency to take the horizontal direction. These strong

branches divide and subdivide considerably in sinuous curves, ending in numerous crowded twigs.

In spring the tree is one of the latest to put forth its leaves, waiting till all danger from frost is over.

In summer, as the leafage becomes full and mature, the tree shows a dense, rounded crown, which affords ample shade, and varies in colour according to its kind.

In autumn the fruit becomes conspicuous, changing from green through shades of red, and, in the Black variety, to purplish black. The leaves slowly assume their yellow fading tint, but remain on the tree some time after those of most other trees have fallen.

The bark is thick, and roughened into vertical folds, reddish brown in colour.

The winter twigs are stout, and have the peculiarity of emitting a milky fluid when cut. The resting buds, arranged alternately on the twigs, are broad at the base, somewhat flattened and pointed. They are protected by scales, and stand on prominent bases. The leaf-scars are large, almost saucer-shaped,

and show from five to seven leaf-traces, more or less grouped.

The leaves vary somewhat, but may be described as generally heart-shaped, though at times, especially in the case of the White Mulberry, they have one or more deeply cut incisions on each side. The margin is irregularly toothed. The colour in the Black variety is a dark green, and the texture is rough and hairy; but in the White variety the colour is much lighter and the surface smooth and shiny. The midrib passes direct to the apex, with six or seven pairs of side ribs, the lower pair of which start from the base of the leaf, and each throws out six or seven strong tertiary ribs to support the lower leaf extension. The flowers are distinct—the pollen-bearing from the fruit-producing. Both kinds may generally be found on the same tree, but not always, especially in the case of the Black Mulberry.

The Mulberry thus shows a tendency to break from the rule observed by all the trees previously noticed. It comes midway between these and the others to be next considered, the Poplars and Willows, in which,

without exception, every tree specialises, producing one kind of flower only. Evolutionary changes, though the work of long ages, are always in progress, and the Mulberry appears to be now at the distinctly transitional point in its life-story, where a tendency to differentiate between a pollen-bearing and a fruit-producing tree becomes evident, in the endeavour to secure the positive advantage of assured cross-fertilisation. The pollen-bearing flowers are grouped into loose, catkin-like green tassels, near the base of the young dwarf shoots. The pollen dust, which is conveyed by the wind, is greenish white. The fruit-producing flowers, bunched into short spikes, stand out also about the base of the dwarf shoots, and occasionally at the junction of the lower leaves of the same with the shoot.

The fruit is really a crowded cluster of stalkless stone fruits, very juicy, and with "skins" that easily rupture. This fruit cluster has the appearance of a large, somewhat elongated blackberry, though, unlike the blackberry, it is the product, not of one flower, but of many.



## XI

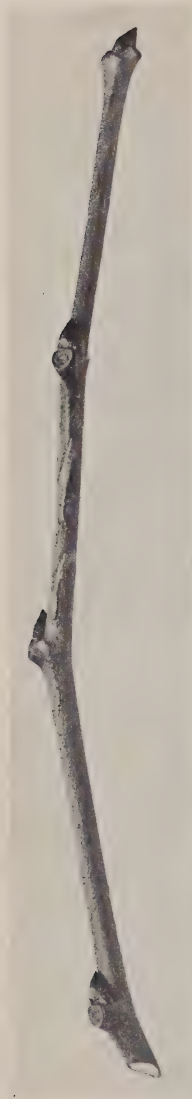
### THE POPLARS

THERE are three kinds of Poplar that particularly claim our attention. These are the Aspen, the White Poplar, and the Black Poplar. In addition we have the tall Lombardy Poplar, which may be regarded as a variety of the Black Poplar; the Grey Poplar, usually held to be a hybrid between the Aspen and the White Poplar; also some less common kinds assimilating, more or less, to the Black Poplar, as the Canadian and the Balsam Poplars. Of these the Aspen and the White Poplar are native trees; the others are of comparatively recent introduction.

Speaking generally, the Poplars may be described as trees with a spreading habit of growth. They are light-loving trees, and therefore are seldom to be met with in our woods, but chiefly upon the borders



ASPENS IN SUMMER.



1



2



3



4

(1) WINTER TWIG OF MULBERRY. (2) RESTING BUD (ENLARGED) OF MULBERRY. (3) WINTER TWIGS OF ASPEN (ONE WITH CATKIN-BUDS), ALSO FOLIAGE-BUD (ENLARGED). (4) WINTER TWIG AND RESTING BUD (ENLARGED) OF WHITE POPLAR.

of these and in the open fields, preferably in the near neighbourhood of water. They have the power of putting up root suckers in abundance, and can, therefore, reproduce themselves freely without depending so much upon the growth of seedlings.

In winter the looseness of their branching is very apparent. In the Black Poplar and its immediate allies, with the exception of the pyramidal Lombardy Poplar, the long, straggling branches and slender, wide-apart twigs produce an effect that is almost ungainly; and all the more so because of a tendency to grow lop-sided, which is habitual to these trees.

In the early spring, long before the leaves appear, they put forth a multitude of catkins, long and drooping, which often completely clothe the trees. The Poplars, amongst trees whose fruit-producing flowers are fertilised by the wind's agency, afford the best example of the most advanced methods for its accomplishment. They may be regarded as the standard in this particular towards which the other wind-fertilised trees are approaching. Cross-fertilisation, so

essential for the vigour of the race, is here assured by the fact that the pollen-bearing and the fruit-producing flowers are not only grouped in separate catkins, but these catkins are borne on separate trees ; so that we have here pollen-bearing trees and fruit-producing trees, separate and distinct. In order that the pollen dust may not be obstructed and wasted by the intervention of foliage, these catkins, growing out from lateral buds on the previous year's shoots, are produced, ripened, and their work accomplished before the leaves begin to unfold. The pollen-bearing catkins are long and pendulous, so loosely composed and hung that they shake out and scatter their pollen dust with the slightest wind. The fruit-producing catkins also, when ready to receive the pollen, are pendulous, and quiver and shake, the more readily to intercept it as it is borne past. As a further precaution against failure the pollen-bearing catkins are produced in excessive numbers, so that the air becomes crowded with the floating pollen grains. Haphazard as would seem this method of distribution by fitful agency





TRUNK AND BARK OF ASPEN.



TRUNK OF WHITE POPLAR.  
Showing both smooth and rough bark.



ASPEN (DROOPING VARIETY).  
Completely covered with pollen-bearing catkins.

of wind alone, failure of each tiny fruit-producing flower to secure fertilisation is practically impossible. When their work is done the pollen-bearing catkins fall and litter the ground.

In summer, by the time the leaves are fully grown, the fruit ripens. Long tassels of cottony fluff hang pendent for a time, and the seeds, each with its cottony attachment, are gradually carried away by the wind. Eventually the tassels themselves, or what is left of them, fall, making fresh litter below.

The leaves of the Poplars, particularly those of the Aspen and the Black Poplar, rustle and quiver with every breath of wind, suggesting multitudinous merry life, with subtle whisperings, rippling laughter, and frolicsome joy-dance. It must be a dead calm indeed for the interplay of air and sunshine among the quivering Poplar leaves to cease. By this almost perpetual motion these leaves are able to secure increase of light and air, with quickened respiration probably, and possibly an advantage to themselves in ridding their surfaces

of excess of moisture, aiding evaporation and shaking off rain drip.

In autumn the leaf-changes vary, but mostly to yellow, orange, and brown. A peculiarity is noticeable, especially with some trees, in that these autumn tints are at first assumed only partially, producing a somewhat patchy effect. So we see at times a blaze of yellow and gold amidst the elsewhere unchanged green.

*The Aspen.*—This is the smallest and shortest-lived of the Poplars, yet for us it takes pre-eminence among them from the fact that it is undoubtedly a native tree. It is, moreover, the most interesting, and has the pleasantest associations. Its branches are few and slender, with a tendency to become pendulous at the extremities. With this tree the characteristic movement of the leaves is most pronounced and continuous. "To tremble like an Aspen leaf" has become proverbial. An ancient legend pathetically accounts for the Aspen's trembling: it alleges that the Cross was made from its wood, and that



the tree ever since has shuddered to remember its part in the great tragedy. Yet to our view the associations of the Aspen are rather those of joyousness, of free, bounding life. Grouped beside some quiet waters, rising over the floating water-lily leaves, and the swaying flags along the margin, the clump of Aspens stands out gracious and tender, yet cheery withal, in the never-ceasing ripple over and around its leafy crowns, whilst the reflected sunshine shimmers and flashes there. Above are twinkling lights, while beneath is a tremulous shade.

The bark is greenish grey and smooth at first, but roughens as the tree attains maturity. The twigs are polished, rounded, yellowish brown in colour. The resting buds, arranged spirally on the twigs and pressed, more or less, close up to them, are pointed, glossy, and sticky. Their colour is chestnut-brown. The flower buds are larger and stouter. The leaf-scar of the Aspen, and of the Poplars generally, is usually described as semi-lunar, but it is subject to much variation. It has three leaf-traces. The



leaves are of thin and firm texture, smooth, rounded in shape, with numerous blunt or incurved teeth. The under surface of them is lighter in colour, sometimes greyish. The stalks are long, and are flattened sideways, acting like a piece of tempered watch-spring, maintaining the tremulous motion, and distinctive pendulum-like side-swing of the leaves. On the suckers which spring up plentifully from the shallow, spreading root system, the leaves are more triangular in shape, are without marginal teeth, and have shorter stalks. As is characteristic of all Poplar leaves a single midrib passes from the stalk direct to the apex, with branching side ribs, the lowermost pair of which start immediately from the base as strong secondaries in support of the lower leaf extension. The catkins of pollen-bearing and fruit-producing flowers are thickly covered with hairs, rendering them distinctly furry.

*The White Poplar, or Abele.*—This tree can also claim to be native with us. It has usually a denser crown than other Poplars, its long branches being more fully furnished



WINTER TWIG  
OF BLACK  
POPLAR.



Black Poplar.

Aspen.

White Poplar.

LEAVES OF THE POPLARS.



TRUNK AND BARK OF BLACK POPLAR.



TRUNK AND BARK OF LOMBARDY POPLAR.

with lesser branchings, twigs, and foliage. It endures shade better, so may be oftener met with among the trees of the more open parts of the woods. Its leaves are much less mobile than those of the Aspen, and without their side-swing. In the wind they are flung upwards, exposing their white under surface, giving to the tree an almost snowy appearance in contrast with the greenery of other trees.

The bark is the greenish grey so characteristic of the smooth Poplar bark; but this tint, and the attendant smoothness, are with the White Poplar more pronounced, and longer retained, than with its allies. The lozenge-shaped breathing apertures in its smooth grey surface are numerous and very noticeable. Not until the tree is well matured does the bark at the base commence to roughen. The new shoots and young leaves are covered with a white cottony down, as if smothered with roadside motor-dust. This down easily rubs off. Remains of it are nevertheless found on the winter twigs, giving to their natural olive brown colour a greenish grey appearance. The



resting buds are spirally arranged on the twigs and are shorter and less pointed than those of the Aspen, not sticky, but covered with cottony down as are the twigs. The catkin buds are larger and more rounded. The leaves when mature are thick and tough, deep green, and smooth above, with the under surface so thickly crowded with white hairs as to give the appearance of white felt; they are also felt-like to the touch. In shape they are more than usually variable. They may be almost heart-shaped with sinuous outline; or rounded, or long oval, with blunt teeth; or cut into, forming three or five distinct divisions, as is generally the case with those growing on the very numerous suckers. The leaf-stalks are shorter than those of the Aspen, very little flattened, and the leaves are carried more horizontally. The catkins of pollen-bearing flowers are very slightly hairy, those of fruit-producing flowers not at all. These last are green in colour.

*The Grey Poplar.*—The Grey Poplar combines more or less the characteristics of



the Aspen and the White Poplar. In habit of growth it is very similar to the latter tree, but its twigs and buds are less hairy. Yet its buds are not sticky like those of the Aspen. The leaf-stalks are rather more flattened than those of the White Poplar. The leaves are more like the Aspen's in shape, but lighter in colour and hairy on the under surface, though less so than those of the White Poplar.

*The Black Poplar.*—This tree is black in the sense only that it is not white, being so named in distinction from the White Poplar. It is a somewhat ungainly tree, awkwardly branched, straggling and lopsided. It possesses a large crown abundantly clothed with foliage, but has a light and airy appearance from the clear green of its leaves, and their constant swaying motion. In this respect it is characterised by a like tremulousness, with the sustained rustling, of the Aspen. It is not a native tree, but is said to have been introduced into this country about the middle of the eighteenth century.

The bark is dark grey, rough from very

early in life, becoming extremely so later, with huge irregular swellings that give it a cankered appearance. The winter twigs are yellowish brown in colour, slender, cylindrical, hairless, and glossy. The resting buds, arranged spirally on the twig, are long, tapering to a point, somewhat incurved, so as to press against the twig, but with the points free. They are heavily coated with balsam. The leaves are variable in form, particularly at the lower end, where they may be rounded or wedge-shaped; otherwise the general outline is triangular with long drawn-out drip-point. Their margins are regularly toothed, and their colour is a light fresh green. A peculiarity which is rare amongst our trees is that these leaves have practically the same tint on both the upper and under surfaces. When first put forth their colour is bronze, changing to yellow; and a tree freshly in leaf, seen from a distance, looks as though it were covered with bright yellow blossoms. The leaf-stalks are flattened sideways, as are those of the Aspen. These so bend over that the posture of the leaves suspended from

them is vertical, even on the upright shoots. In consequence their upper surface is always presented to view, and their habitual side-swing probably helps to counteract the effect of any shade that may arise from the overlapping of neighbouring leaves. The catkins are more loosely constructed than those of the other Poplars, and are without hairs. They are produced high up in the tree. The pollen-bearing catkins are a brilliant red, the fruit-producing catkins green.

A marked peculiarity of this tree is that the fall of the leaf is accompanied by a fall of twig and even of branch. Here is an instance of self-pruning as a check upon over-luxuriance. This severance does not leave an open wound, but a healed scar, similar to that resulting from the fall of the leaf, and thereby affording evidence of determined purpose beneficial to the tree's well-being.

*The Lombardy Poplar.*—The Lombardy Poplar is generally regarded as a variety of the Black Poplar. Its branches rise almost parallel with the main stem, and give the tree its well-known spire-like form. In

nearly all other details it conforms to the habit of the Black Poplar, or with but slight variations. The thick growth of its branches, often from the very base of the trunk, should be noted ; and also, when not so concealed, the multiple-pillared aspect of the trunk as though a number of main stems had coalesced. The trees that grow with us have pollen-bearing catkins only, which cluster about the top of the Lombardy's spire. There are no fruit-producing trees of this variety in Britain.

These uplifted spires of the Lombardy Poplars, especially when growing in a line, are notable and impressive. They give a distinctive character to the landscape in which they are found, suggestive of aspiration, but with none of the sombreness which seems to belong to the Roman Cypress, the only other tree with us that takes this form. The Lombardy Poplar is full of strong life, surging upwards like a jet from a water-main, or like a flame. Flame-like it is, in very truth, when autumn has turned its greenery to shining gold, and autumn winds make it quiver and sway from base to tip, in

sweeping curves, deflected, recovering ; whilst autumn sunshine makes it glow "as with fire."

*The Balsam Poplar.*—This tree also conforms closely to the habit of the Black Poplar. The main distinction is in respect of the leaves and twigs. The leaves are coarser in texture, darker green above, and very light green, almost grey, below. The leaf-stalks are not flattened. In consequence the leaves are upheld stiffly, and stand out more or less horizontally, while there is no side-swing. The twigs are thicker and stronger, as is needful, to bear the increased weight, together with the greater wind-strain due to the comparative immobility of the leaves. The branches also are more sturdy, and less straggling. The whole aspect, indeed, of the tree is heavier than that of the Black Poplar.



## XII

### THE WILLOWS

THROUGH a curious misreading of an ancient incident the Willows have long been made to symbolise a brooding sorrow. It was not strange that, to the weary hearts of the exiled, incitements to joyousness should have served rather to evoke the opposite emotions of bereavement and sorrow. "By the rivers of Babylon, there we sat down, yea, we wept, when we remembered Zion. We hanged our harps upon the Willows in the midst thereof." To the undisturbed in heart the Willows are suggestive of a serenely gracious joyfulness. Garlanding the rounded river pools, over which the gauzy-winged children of the air dance out their short day of life, and the swallow curves in swift flight, pausing but to dip its breast feathers in the alluring water, across which the kingfisher with arrow-like passage strikes its sky-blue

trail, there, with lovely exuberant grace, the Willows keep homely festival. Even when rudely pollarded, though at first their club-headed trunks look gaunt and almost ridiculous, yet they speedily acquire a new kind of grace with the growing out of their long-spreading osier branches. If not when standing singly, yet in extended wavy line along the water margin, they possess qualities sufficiently picturesque to win regard, and, therewith, no little admiration for their brave recovery from cruel maiming.

The Willows are a tribe in themselves, with a multitude of related family groups. They vary in character and habit from tall, spreading trees to low-lying dwarfs which barely over-top the grasses; indeed, the smallest of them, with buried stem, scarce lifts its branch tips above the mountain mosses. They are not only numerous and various, but are most intricately involved, having hybridised almost without limit. An expert, even with all the resources of the laboratory at his disposal, cannot always distinguish among them or read off without shadow of doubt every Willow's ancestry.

It must suffice for us if we regard only certain broad characteristics and groupings of the Willow tribe, noting the more obvious distinctions, and holding all besides in more or less doubt.

Those Willows which grow into trees of size are the White Willow, the Crack Willow, and the Weeping Willow. Added to these as occasionals are the Almond-leaved and the Bay-leaved Willows. The Goat Willow, or Sallow, is also found as a small tree, but more often as a large bush, or as a hedgerow shrub. Other Willows grow naturally, or are grown artificially, as Osiers; whilst others, chiefly found at high altitudes, have, as has been mentioned, a dwarf and creeping habit, with their main stems on, or under, the ground.

The bark of the Willows, in maturity, is thick and deeply furrowed. The branches and twigs, with the exception mainly of those of dwarf habit, are long, slender, and very pliant, justifying the name Willow, or "willing." The buds are arranged spirally on the twigs and are generally long, pointed, and, more or less, pressed up against them.



POLLARD WILLOWS IN SUMMER.



WILLOW LEAVES.

- 1, Crack Willow. 2, Bay-leaved Willow. 3, White Willow. 4, Sallow. 5, Almond-leaved Willow.



Each is protected by a single scale, which is a rare characteristic among the buds of our trees. The leaf-scars are narrow, crescent-shaped, and show three or five leaf-traces. The leaves, speaking generally, are long and narrow, and more or less lance-shaped; but there are considerable variations, as will be indicated. They vary in colour also, but mostly they are shining green on the upper surface and silky or cottony beneath. The latter quality is productive of that silver sheen in the Willows, which affords so marked a contrast against the heavier green of their companions, the Alders. The Willow leaf has a strong midrib, branching with many alternate secondary ribs, which, however, do not reach the leaf's margin, but bend over and lose themselves in sub-division.

The flowers are grouped in catkins. The pollen-bearing catkins are distinct from the fruit-producing, and are borne on separate trees, after the manner of the Poplars. But the Willow catkins of both kinds are stiff and erect. Moreover, these catkins, with exceptions to be referred to later, are produced

at the same time as the leaves, and attain maturity only when the tree is fully covered. They grow out as dwarf shoots from lateral buds on the previous year's twigs. These catkin shoots in some instances do, and in other instances do not, bear foliage also. Their erect attitude and late appearance mark a departure, and indicate a probable advance on the part of the Willows as compared with the Poplars. The Willows do not entirely, nor indeed chiefly, depend upon the wind's agency for the conveyance of their pollen to the fruit-producing flowers. Both kinds of flowers provide nectar. Though these flowers exhibit no showy petals, their hidden sweets afford effective attraction to the multitudes of insect visitors. The pollen dust also has undergone modification. Seen under the microscope it is not smooth as is wind-blown pollen, but roughened, and thereby better adapted to attach itself to the body or limbs of a welcomed visitor, by whom it is conveyed in due course to the next fruit-producing flower that is visited.

The fruit is produced in catkins, which ripen in early summer, and appear as finger-

lengths of cottony fluff. This fluff breaks away in the wind, and bears the seeds over the meadows, or floats with them down the stream, till place and conditions suitable for growth are found.

*The White Willow and the Crack Willow.*—

These are the most frequent Willow trees met with, either in their full-branched or in their pollarded form. There are also many varieties and hybrids of these. They have the typical lance-shaped leaves. Those of the White Willow are distinguished by the presence of silky hairs on the upper as well as on the lower surface—densely so when young—whilst those of the Crack Willow are nearly, or quite, hairless. In both the margins are toothed. A useful distinguishing fact is the presence on the leaf-stalk of the Crack Willow, close up to the leaf, of two small protuberances (glands); these are absent from that of the White Willow. The small stipules, or rudimentary leaves, found at an early stage at the base of the leaf-stalks, are narrow and pointed on the White Willow; and broader, kidney or half-

heart shaped, on the Crack Willow. These, however, soon fall after the leaves have expanded. The chief distinction is afforded by the action of the twigs. Those of the Crack Willow, otherwise supple as those of the White Willow, break off at the base, where, especially in the springtime, they are brittle as glass. The fracture is a clean one, leaving no jagged edges. This procedure serves, perhaps, to put a check upon over-luxuriance. From this habit the tree derives its name. The twigs of the White Willow do not so "crack." The White Willow is so named because of the white, silky hairs which are found, not only upon the leaves, but also, to some extent, upon the buds and twigs. The twigs of the Crack Willow are green or yellow, and the buds ruddy or brown ; both are smooth.

*The Weeping Willow.*—The Weeping Willow (otherwise the Babylonian Willow) conforms most closely to the Crack Willow ; but its twigs do not crack. These hang down pendulous in long festoons, which sweep the ground or dip into the water





WEEPING OR BABYLONIAN WILLOW IN SUMMER.





TRUNK AND BARK OF WHITE WILLOW.



(1) WINTER TWIG, SHOWING LEAF AND FLOWER  
BUDS, AND RESTING BUD OF SALLOW  
(ENLARGED).

(2) WINTER TWIG AND RESTING BUD (ENLARGED)  
OF WHITE WILLOW.



beneath. The leaves are narrow, dark green, and without hairs above, and lighter, bluish green, below.

*The Bay-leaved Willow and the Almond-leaved Willow.*—These may be found as trees, but their habit generally is shrubby. They are sufficiently characterised by their names, since their leaves resemble in shape those of the shrubs specified ; they have also faintly the odour of the Laurel and the Almond respectively. Those of the Bay-leaved Willow are broad, and about two and a half times as long as they are broad. They are rounded at the base, and suddenly pointed at the tip ; their texture is almost that of a Holly leaf, and of a like deep, brilliant green above, but paler below. When young the upper surface is slightly sticky. They have several small glands on the leaf-stalk. Stipules, when present at the base of the stalk, are narrow. The leaves of the Almond-leaved Willow are also broad, but about four times as long as they are broad. They are bluntly pointed at the base, sharply at the apex, rather less tough, and

not of quite so brilliant a green as those of the Bay-leaved Willow. Stipules, when present, are broad. The leaves in both instances are toothed. If an individual pollen-bearing flower of the Almond-leaved Willow be examined under a magnifying glass it will be found to possess three stamens. The Bay-leaved Willow flower has usually five stamens. All the other Willow flowers have two only, with the single exception of that of the Purple Osier, which has its two stamens merged into one.

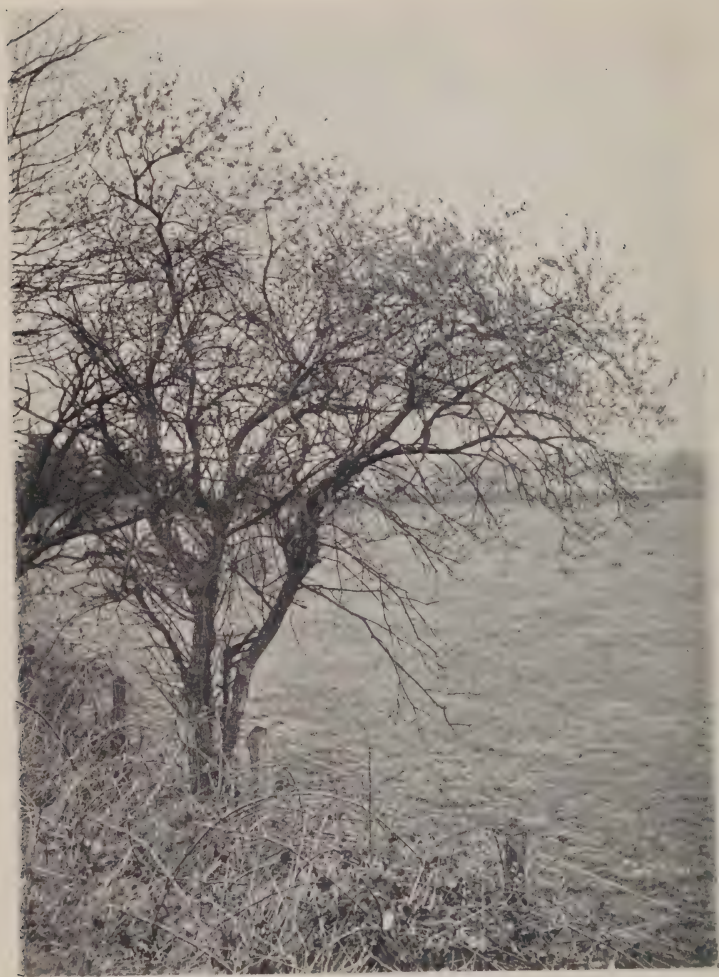
*The Goat Willow, or Sallow.*—This, with its allies, the Grey Willow and the Eared Willow, shows considerable variation from those just described, in twigs, buds, and leaves, and in the time of flowering. Though the Sallow may grow into a small tree, it is generally met with as a considerable bush, or as forming part of the hedgerow.

The twigs are shorter and stouter, the buds are more rounded and larger than in the case of other Willows. The catkin buds are especially large and prominent. The leaf-scars are broader. The leaves, generally,



PURPLE OSIER IN SUMMER.





SALLOW IN SPRING.



are oblong, but sometimes they are rounded. Their upper surface is wrinkled, of a more or less deep green; their lower surface is bluish green. In the Grey Willow they are lighter in colour. The leaf tip often takes the form of a funny little projection, to which a decided twist has been given. The leaf-margins are slightly scalloped. Stipules are large and persistent, especially so on the Eared Willow. The catkin buds open, showing their silvery silken tips. These are fully matured before the leaves appear. The pollen-bearing catkins are more or less globular in shape, very conspicuous and abundant, arraying the whole tree on which they are borne as with bosses of gold. They have great wealth of pollen, in which the bees luxuriate, and which they collect for bee bread. The fruit-producing catkins, on distinct trees, are more cylindrical in shape, and green to silvery in colour. Both kinds of flower supply abundant nectar. There is no question here as to the agency by which the pollen is chiefly conveyed from tree to tree, from flower to flower. In their season the Sallows hum like a beehive, so lavishly

is the banquet spread, so gratefully appreciated, after the long winter's scarcity. With the flowering of the Sallows the hive's activities fully commence. By about the time the leaves have fully matured the fruiting catkins become masses of fluff, and tree, bush, or hedge is whitened as though snow had fallen. The cottony seeds are borne by the wind far and wide.

*The Osiers.*—The characteristic growth of the Osiers is that of long slender branches, rising from a stool at the ground level, to form a spreading bush. By natural preference there are only two of our Willows with this habit, the Osier and the Purple Willow. But since the long slender growth of the young shoots of many of the Willows, as seen especially when trees have been freshly pollarded, adapts these trees to this manner of growth under cultivation, they are often so found among the Osiers. This is particularly the case with the White Willow and its varieties, one of which, the Golden Willow, is very noticeable from the rich golden and deep orange colour of its stems and twigs.

The leaves of the Osier are very narrow and long, the margins being almost parallel for some distance, though inclined to be wavy. They are pointed at both ends. They have silky hairs on the under surface, which lie close down, in a direction parallel to the secondary veins. The silky hairs on the leaves of the White Willow, in distinction, are parallel to the midrib. The flower catkins of the Osier appear before the leaves.

The leaves of the Purple Willow are also narrow and moderately long, generally without hairs, or with very few; they blacken on drying. A distinguishing fact with this Willow is that its buds, and therefore its leaves, show a decided tendency to grow in nearly opposite pairs on the twigs, especially towards the tips; in this respect and to this extent it departs from the spiral arrangement adopted by all the other members of the Willow tribe. The stems deepen in colour to a rich purple, as do the buds also, hence the name given to this Willow. As before stated, the pollen-bearing flowers have their two stamens united, but with the full

complement of the pollen bags. The flowers appear before the leaves.

*The Dwarf Willows.*—These, being Arctic plants, are only found in elevated situations, most of them on the mountains of Scotland, and some on those only of the extreme North, where they find conditions most suitable to their requirements. Their stems usually trail along the ground, rooting as they go, and putting up erect lateral shoots. One of them, known either as the Least Willow or as the Herbaceous Willow, may be met with on more southern mountains, but above the 2,000 feet line. It has its stems wholly underground, whilst its shoots rise but an inch or so. The dwarf Willow most likely to be found south of the Tweed, and at a moderate elevation, is the Creeping, or the Silky, Willow. It may be looked for upon moorland where the heather grows. It prefers a sandy soil. In height it grows from six to twelve, or fifteen inches. Its twigs are usually reddish, or purple-brown in colour. Buds and shoots are silky. The leaves also are covered with silky hairs, though





THE CREEPING OR SILKY WILLOW.  
It barely overtops the Grass.





COMMON ELM IN WINTER (PARK-GROWN).

the upper surface is sometimes without these. In size and shape they are very variable, from half an inch to an inch long, narrow, or more rounded. The margins are very minutely serrated. The flower catkins appear with the leaves. The seeding catkins may be present till late summer.

## XIII

### THE ELMS

WE have two groups of these trees which find representation in the Common Elm and the Wych Elm. The Common Elm is most abundant in the Midlands and the South, the Wych Elm in the North and in Scotland. It is claimed that the Wych Elm is the more truly native, the Common Elm having been introduced by the Romans. Tall-growing, holding themselves firmly erect, almost soldierly in bearing, sentinels of the plains, wardens of the fields, on guard about the farmsteads or beside the village green, their presence is always notable. Companionable among themselves, they choose the places of man's labour "under the sun." There they group themselves and thrive, but they cannot endure the town.

In winter the Elm's uprightness is particularly marked. From the sturdy central

stem, generally at a fair height from the base, the strong branches uplift themselves, tapering gently to the farthestmost twigs. The multitudinous crossings and interlacings of those terminal twigs enclose the tree in a closely set fringe as of finest filigree.

In spring, quite early, this outer fringe changes colour, deepens and reddens to a rosy glow that seems almost to emit light and warmth, a foretaste of more genial days, though yet the skies may be grey and the air "has an edge upon it." For when the Elms are in flower the springtime is fairly assured. Presently the glow fades, changing to a light and tender green. Clusters of winged fruits cover the surface as with foliage, though the leaves are still in hiding. Finally these unfold themselves and clothe the tree with delicate verdure.

In summer, the foliage, now darker in hue, is richly massed. Sun-illumined surfaces gradating into deepest shadows present a roundness and fullness that give to this tree an especial "presence," powerful and well

nourished. The shade it casts is wholly pleasant, and but little harmful to the grassy undergrowth, whereon the cattle rest through the hot hours of noon.

In autumn the Elm leaves retain their colour, but become gradually rusty-looking. Then a small patch here and there shows clear yellow. These patches increase and spread till the time of the fall, which is usually in October.

The bark of the Elm is thick and often corky, roughened, and crumpled. In colour it is a medium grey. The twigs are greyish to brown. The buds are brown, conical in shape, and show several protecting scales. They are arranged alternately on the twig, and stand up on rather prominent leaf-bases, but always obliquely to these. The flower buds are larger and rounded. The leaf-scar is also prominent, approaching the circular in shape, and showing three distinct leaf-traces. The leaves must be considered separately, as these afford the best distinguishing marks. It may, however, be noted here that they have a somewhat lop-sided appearance, owing to



the fact that the halves are unequal, as though on one side of the midrib the leaf-extension had contracted, and shrunk upwards from the base. The leaf-margins show large teeth, which are again cut up into smaller ones.

The flowers grow in close clusters along the twigs—little rosettes of colour. Though small and without petals, yet clustered and massed, they are effective, especially as they appear before the leaves. Each flower is both pollen-bearing and fruit-producing, with central stigmas and from four to six or eight encircling stamens, emerging from a tiny purple cup. The stigmas mature first and overtop the yet immature stamens. When the stamens are ripe and shed their pollen on the wind, the stigmas they now overtop have already received their needed pollen supply from elsewhere. So cross-fertilisation is provided for.

The fruit, in crowded clusters, is in the form of a seed enclosed centrally or nearly so, within a rounded flat envelope about the size of a sixpence; thus winged, it is blown away and along by the wind, falling in

showers, to cover the ground for some distance as with green confetti.

So far we have regarded points of similarity only ; now distinctive differences may be noted.

*The Common Elm.*—It stands up the more commandingly. Its great limbs reach upwards, and their terminal twigs curve forwards. Its bark is more deeply furrowed, more voluminously crumpled and folded. In one variety the twigs show wide expansions of corky superfluous bark in ridges along their whole length, doubling and trebling their apparent thickness. One other tree—the Field Maple—has its twigs so thickened with excess of bark, but in a different fashion, as we shall see later. On the Elm twig these ridges of cork often stand out from the central axis in such a way as to suggest the blades of a ship's propeller.

The leaves, on short stalks, are more or less rounded, with their widest part generally towards the base. The apex is drawn out into a short point. They are coarse in texture and tough, and owing to the presence of

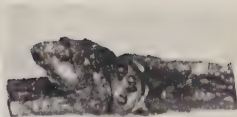
1



LEAVES OF THE ELMS.

1, Wych Elm. 2, Common Elm.

2

RESTING BUD  
(ENLARGED) OF  
COMMON ELM.



TRUNK AND BARK OF COMMON ELM.



TRUNK AND BARK OF WYCH ELM.



short stiff hairs are rough to the touch. The flowers are borne chiefly high up on the tree's crown. The fruit has its seed forward in the rounded envelope, which is rather deeply notched. It falls early, and rarely, if ever, germinates.

In compensation for the lack of germinable fruit this tree has wonderful power of putting up strong root suckers. If a tree were securely fenced at the distance to which its roots extend, the enclosure would presently become a thick forest of young Elms. What really happens is that the suckers of unenclosed trees are destroyed, whilst still young, either by the plough or by grazing animals. But those that rise in the hedge bottom are protected. These, supported from the tree roots, grow strongly. If the hedge is regularly clipped it becomes, for some yards on either side of the tree's base, an Elm hedge only, for it entirely supplants what was there before and gave it protection. If the tree is cut or blown down, the Elm hedge remains, witness that such a tree once stood there. If the growing Elm hedge is left unclipped the stronger



suckers take the lead. These kill off not only the hedge plants but their crowding neighbour suckers, and become young Elm trees growing in line. It is in this way that the line of Elm stalwarts is produced, and a succession is secured.

*The Wych Elm.*—This tree has its branches more spreading. Its great limbs usually branch out from the stem at a lower level, and tend to droop at the extremities. This drooping tendency we see confirmed in the not infrequent specimens of “weeping” Wych Elms. Its bark is more regularly, less deeply, furrowed. Its twigs are never thickened with excessive growth of cork. Its leaves, practically without stalks, are larger, more oval in shape, and have their widest part more forward towards the apex, which is drawn out into a long point; their texture is coarser, they are more strongly ribbed, rougher to the touch above, softer beneath. The flowers, though most abundant high up, yet grow freely on the lower twigs also. The fruit has the seed more truly central in the rounded envelope, which



THE AVENUE OF ELMS IN THE LONG WALK, WINDSOR.



HOW THE LINE OF ELMS IS PRODUCED, AND A SUCCESSION  
IS SECURED.

is less deeply notched ; it remains a considerable time on the tree, and some of it has germinating power. The Wych Elm has not found it necessary to specialise in root suckers.

## XIV

### THE ASH

IN the Ash loftiness and strength are suffused with beauty and grace. Ruskin says there is no lovelier tree in the world. She has no rival. In the hedgerow, in the open meadow land, on the hill slopes, she maintains a natural apartness, in all simplicity and nobility of demeanour, as of one whose primacy is native and assured. Dainty is the Birch as a girl of "sweet seventeen"; diaphanous gauze is her attire, and the rhythm in her every movement is as the play of the dancer's limbs and feet. Stately and mature is the Ash; hers is raiment as of fine needlework, and she wears a jewelled crown. She shall be Queen of the Summer.

In winter the natural stateliness of the Ash is best realised. The main stem rising, often without division, high towards the



summit displays great firmness of line, strong without heaviness, as a column of steel, fitly proportioned to the weight of the superstructure. ✓ Each limb, or arm, rising and extending in pure unencumbered curves, shows a like blending of firmly girt power and resilience. These several curves of each limb are merged into the larger curve and onward flow of the whole, as it sweeps outward towards the tree's margin, where it dips for a space, then lifts itself upwards, bearing its grouped twigs like the balanced branchings of a series of candelabra. And there at the extremities, if the tree has fruited, droop those distinctive clusters of "keys," which, even in the modified sunshine of winter, still maintain something of the lustre that was theirs amidst the glowing lights of the autumn.

✓ In spring, when most other trees have broken, or are breaking, into leaf, the Ash, blossoming all over, first "adorneth herself with her jewels," glistening as with ruby and amethyst. Later the feathered leaves spread out their soft greenery, gracefully drooping, overlapping and interlacing, forming

flounces and fringes; but then the full summer is here.

In summer if we would enter into the serene joy of the Queen of the Summer, we must get within the range of her shadow. It is good, in the heat of the day, to lie there on one's back and watch, as one may without tedium, the blue of the sky as it ripples and drips in and among the pervading green translucency, merging, vanishing, and re-appearing, making and breaking infinite patterns of changing light and colour, as the wind swaying the branches gently tests the delicate poise of the leafage.

In autumn the lightly coloured clusters of full-grown "keys" early assert themselves, gleaming, pendent like ordered ornament, amidst the mature green of the foliage. These change to yellow and bronze, until presently they predominate, shining with metallic lustre as of hammered copper or beaten gold. But not all the trees, nor always the same trees year by year, make thus their final display. The Ash, slow in the spring to robe herself in green, is amongst the earliest to disrobe in the autumn.

The bole is firmly cylindrical, knit together, hard and strong. The bark, but moderately roughened with orderly fissures, is light grey in colour, rendered often silvery by abundance of clinging lichen. The winter twigs are stout and smooth, curved, compressed and flattened where the buds emerge, strengthened with side-stays to support the coming leafage, which will be large and weighty. The resting buds are velvety black, in strong contrast with the greenish grey twigs, on which they are borne in opposite pairs. The leaf-scars are large and prominent, nearly circular in outline, within which, and parallel thereto, the leaf-traces, merged together, form a strap-like curve.

The leaves are compound, like those of the walnut; they comprise from two to six pairs of leaflets, with a single terminal one. This subdivision of large leaves into leaflets on several of our trees has arisen from the necessity to reduce the strain caused by wind pressure, and in avoidance of rending and breaking. Each leaflet, attached usually without stalk to the side of the extended

midrib, is a long oval, pointed at both ends, sharply at the apex. It is thin and smooth in texture. Its margin is irregularly toothed. The terminal leaflet is largest, and each several pair of leaflets beneath shows a gradual diminution. The main midrib is channelled on the upper surface, as is the leaf-stalk, which broadens at the base, partly enclosing, as if for protection, the young new bud. In autumn the leaflets often fall separately, leaving stalk and midrib to fall later.

The flowers, which grow out from beneath the as yet unopened buds, form mossy clusters of a ruddy purple colour. Though without petals, they are very conspicuous on the leafless twigs. Normally each flower of the cluster is complete, having two stamens and a flask-shaped pistil with two stigmas. As with the Elms, these stigmas mature first, so that what pollen reaches them comes carried by the wind, from the stamens of more forward flowers. But there is great indecision as to character in the flowers of the Ash. In some are stamens that fail to develop; in others the stigmas are absent.

Some branches, and indeed some trees, have only incomplete flowers of one kind or the other, and these are said to vary also from year to year. The flowers of the Ash are evidently in process of transition, and the problems involved are of special interest.

The fruit consists, like that of the Elms, of a seed (or nut) enclosed in a flat envelope, which, when the need arises, serves the purpose of a wing. This wing is long and narrow, and has often a twist like the blade of a ship's screw. The seed is at the base, close to the footstalk. The fruit clings firmly to the twig through most of the winter, till the attachment becomes weakened, weather-worn. It is then torn away by the first strong wind and carried afar. It alights seed downwards, and the screw-twist, which, when present, has probably aided its farther flight, may now, straightening and twisting under the alternations of dryness and moisture, serve to facilitate the seed's entry into a suitable crevice, or into the soil itself.

As with the Wych Elm, so with the Ash, there is a drooping (or "weeping") variety of frequent occurrence.



## XV

### THE MAPLES

IN this group there are two trees of most frequent occurrence — the Great Maple, usually spoken of as the Sycamore, and the Field or Common Maple. Other two, less frequent, are the Norway Maple and the Ash-leaved Maple, or Box Elder.

These trees, being of the same order, naturally have much in common, but they also show considerable and interesting divergencies. The bark of the Maples is, as a rule, scaly, that of the Sycamore is the smoothest of the four, whilst that of the Box Elder is most roughened. That of the Norway Maple, however, is not scaly. It presents a surface, broken up into narrow vertical fissures, having some resemblance to that of the Ash in texture, but with a slightly ruddy colouring. One invariable characteristic of the Maples is that the buds, and



TRUNK AND BARK OF ASH.



COMPOUND LEAF OF ASH.



ASH IN WINTER.

therefore the leaves and the twigs, are arranged in opposite pairs, each next succeeding pair being at right angles to that preceding. This will be found conclusive in distinguishing, at any season, a Maple from a Plane, on which the arrangement of the buds is alternate.

The typical Maple leaves are five-fingered, after the manner of those of the Plane; they have five main divisions, each of which possesses a separate main rib that proceeds from the point of junction with the stalk, and terminates at the apex of its own leaf division. The leaf of the Box Elder is not simple, but compound, after the manner of the Ash or the Elder, hence this tree's alternative names. This compound leaf has usually five (sometimes three only) individual leaflets.

The flowers of the Maples have special interest in that they afford a striking illustration of the different stages intervening between the wind-pollinated flowers without petals or nectar, and the insect-pollinated flowers with nectar and rendered more conspicuous by petals. The Box Elder is

entirely wind-pollinated, and has neither petals nor nectar. Moreover, its flowers are distinct, the pollen-bearing from the fruit-producing, and grow on separate trees. The Sycamore's flowers of both kinds grow together in a single drooping cluster, and each flower has small green petals and store of nectar. The Field Maple has similar flowers, but these are grouped in erect, more open clusters, with petals relatively somewhat larger, and yellowish green in colour. The Norway Maple has larger, erect, and closer clusters, with larger yellow petals—much more conspicuous, and rendered more so still from the fact that the flowers open before the leaves expand. The fruits grow in pairs, as winged seeds, joined at the base. In their dispersal these winged seeds come apart, each as it is borne away by the wind spinning vigorously. Each is, in fact, something between a parachute and an aeroplane, and is capable of travelling a considerable distance with the wind. The angle, or otherwise, which these paired and winged fruits take in relation the one to the other, whilst on the tree, is



a useful distinguishing mark among the Maples.

*The Great Maple, or Sycamore.*—This tree gives the impression of sturdy self-reliance. Though not a native, it has made itself thoroughly at home with us, and its seedlings spring up everywhere, with the abundance and vigour of weeds.

In winter it is seen to be supported by a well-proportioned main stem from which strong branches emerge, low down, and more or less horizontally, whilst those higher sweep upwards, with set purpose, and terminate in stout forked twigs. It is manifestly built for endurance, and can offer a stubborn resistance in the most exposed situations.

In spring, as the young leaves emerge, they show considerable admixture of colour, browns and reds frequently predominating. Expanding, after the manner of a fan, they are large and well sustained. Beneath them, as in a series of delightful tented shades, droop their many-flowered clusters, centres of joyous activity on the part of a multitude of welcomed insect guests.

In summer the tree's moulded outline, almost formal in its distinctness, at once differentiates it amongst its fellows. Its billowy masses and rounded bosses of dark and handsome foliage, most skilfully arranged in closest fitting mosaic, intercept and bar every ray of light, and make for all beneath a solid shade.

In autumn its graceful, lengthy tassels of winged fruits droop, brilliant in reds and browns, amongst the changing leaves as these fade to yellow and brown. But at this season the tree often suffers strange disfigurement, splashed as it were with tar; the black stains of a fungoid growth blot the leaves, and make for them a loathsome ending.

The twigs are thick, brown or grey in colour, and polished. The resting buds project at a small angle, and are protected by yellowish green scales. The terminal bud is large. The leaf-scars are crescentic. The angular incisions separating the leaf-divisions are acute. The leaf-margins are irregularly toothed. The leaf-stalks are often a brilliant red. The paired winged-fruits take the form

more or less of a horseshoe ; whilst each separate wing, curving broadly at the apex, narrows towards the base, and is bounded by a flowing line which is surely one of the most beautiful in nature.

*The Field Maple.*—This, when met with as a tree, is of smaller dimensions every way. It shows a rounded, rather stunted, crown. Chiefly found as a hedge plant, it is most noticeable for its autumn colouring of shining gold, brilliant, as with glow of sunshine, amidst the prevailing greens and reds and browns.

The twigs are velvety, and yellowish green to brown in colour. These become very thick and corky, after the manner of some Elm twigs, but they do not show the extended elongated wings of the latter. The buds are pressed up against the twig, and are green to brown in colour. The terminal bud is small. The scars are V-shaped. The leaves have five broad, bluntly pointed divisions ; and the incisions between these are deep and rounded. The margins are wavy rather than toothed. The wings of

the paired fruits have their edges parallel, and are extended in a straight line, sometimes even reflexed. Crowded excrescences of a brilliant red, the work of a mite, are frequent on the leaves.

*The Norway Maple.*—The closest resemblance between a Maple and a Plane is shown by this tree, insomuch that it is described as the “Plane-like” Maple. On the other hand, one of our Planes is distinguished as “Maple-leaved.” The Norway Maple may, however, readily be recognised by its bud and twig arrangement, as previously noted; by its bark, which is not scaly, but fissured and furrowed; and by the fact that its growing buds, though carefully shielded, are not enclosed in the bases of the leaf-stalks, nor its resting buds surrounded by circular leaf-scars. Here the leaf-scar is V-shaped, with the long arms half embracing the twig and meeting the corresponding arms of the opposite scar.

The twigs are red or brown, and sometimes green. The buds are pressed up against the twig, shining, and green merging



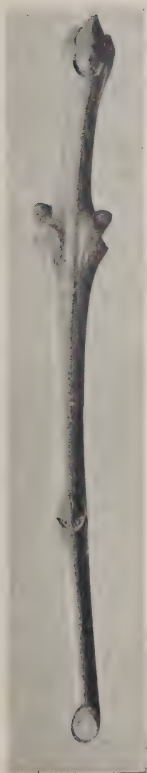
RESTING BUD  
(ENLARGED) OF  
ASH.



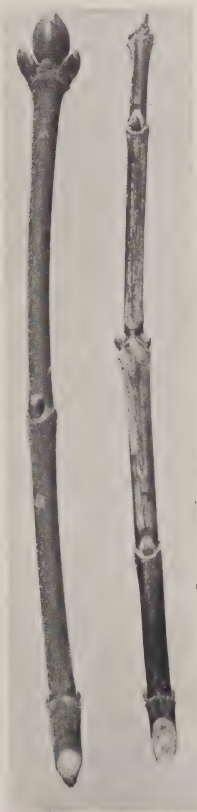
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LARGED) OF  
NORWAY MAPLE.



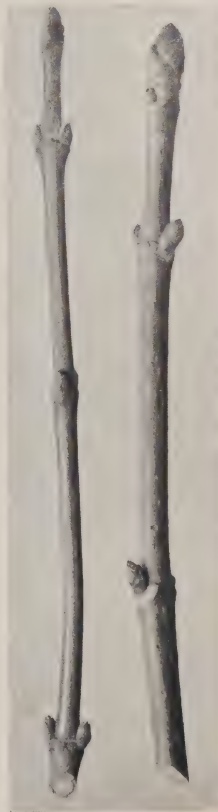
RESTING BUD (EN-  
LARGED) OF  
SYCAMORE.



WINTER TWIG  
OF ASH.



1  
2  
WINTER TWIGS OF  
(1) Norway Maple.  
(2) Ash-leaved Maple.



3  
4  
(3) Field Maple.  
(4) Sycamore.





FIELD MAPLE IN WINTER.



TRUNK AND BARK OF NORWAY MAPLE.



TRUNK AND BARK OF SYCAMORE.



Sycamore.  
Field Maple.

Norway Maple.  
Ash-leaved Maple, or Box Elder.  
LEAVES OF THE MAPLES.

into brown or red. The terminal bud is large. The leaves have five (or seven) elongated, sharply pointed divisions; and the incisions between are wide. Their margins also have numerous long and sharp points. Their colour is light green above and below. They have generally five main ribs, with a small additional pair at the base. Before the leaves expand crowds of flower-clusters, at the tips of the twigs, of a greenish golden yellow, make the tree a great bouquet of blossom, one of the most noticeable and beautiful objects of the season. The wings of the twin fruits, having their edges parallel, widely diverge.

*The Ash-leaved Maple, or Box-Elder.*—This tree is usually grown in gardens, preference being given to the variegated form, with leaves both white and green. The twigs are smooth and green, and continue so for a long time, since the epidermis, or true skin, grows with the twig's growth, and does not, for several seasons, split or shrivel, or die into bark. The buds also are green, but coated with silvery hairs. The leaf-scars

are similar to those of the Norway Maple. The leaves are compound. The flowers are grouped into feathery tufts, growing with the leaves from the sides of the twigs, and, as already mentioned, are found on separate trees, and are without petals. The twin fruits are joined together at an acute angle, their wing extensions curving inwards.



## XVI

### THE HORSE CHESTNUT

IT is a pity we have not a more suitable name for this tree. It has distinctive character enough to merit other than a borrowed title, and the somewhat depreciatory epithet is wholly undeserved. It ranks as one of the noblest of our trees. Having a rather formal outline, it is seen at its best in the massed group, or in the long line of the wide avenue; but it is welcome anywhere, and anyhow, in our landscape—the embodiment of a strenuous and lordly life. It has also marked decorative quality, varying according to season, but never absent, and not merely with respect to the tree as a whole, but in all its minor details.

In winter there is strong suggestion of determined vigour in the upgrowth of its firmly planted stem; in the outgrowth of

its ordered branches ; in the wave-like progress of these, rising, flowing over, and rising again, or curving away upwards, thrusting their well-varnished and handsome buds into the open air and light.

In spring, in the earlier days, these buds, opening their brown outer scales, become suddenly more conspicuous in coating of creamy green. Those that are terminal, in particular, stand forth as myriads of candles on myriads of steady branchings, and seem to need but the touch of flame to make the whole tree one great illumined candelabrum. But another aspect is first assumed. From every bud flow out and overflow, as fountains of living verdure, the emerged leaflets, downward pointing. So they hang pensive for a while, till all the tree becomes as a green cascade. This is but Nature's pause. Slowly, steadily, each separate leaflet straightens itself out, seven leaflets to a single leaf, spreading open-handed, horizontally, and, as it were, upholding a central spike, which becomes a spire, and then the expected flame. So myriads of flames illumine the tree all over, spreading along and

over all neighbouring kindred trees, flowing along the lines of the broad avenue, from base to summit, from end to end, noblest expression these islands can show of exultant vitality in the year's wealth of blossoming.

In summer there is again a pause. Masses of deep green build up the shapely pyramid of growth, all overlaid with patterned ornament in the varied tessellation of the symmetrical compound leaves, which are so carried and fitted as to yield a wide and welcome shade.

In autumn there is new display. Great range of colour, varying, according to the season, from clear yellow to rusty brown, spreads itself over the whole tree. The clusters of spiked fruits pass from green to brown. Some fruits open on the tree, others fall to the ground with a thud, to open there, exposing the brilliant seeds.

The bark is moderately smooth but scaly. The twigs are stout, as is needful, since they must support great weight of leafage. The buds are arranged, as those of the Maples, in opposite pairs. Enclosed in stout scales, they are further protected by a thick coating

of varnish. The leaf-scars are large, light in colour, shield or hoof shaped, depressed as if branded into the substance of the twig. They show from seven to nine leaf-traces.

The leaves are compound, having usually seven leaflets. Each leaflet is of large size, rounded near the apex, to which it tapers, suddenly ending in a point, narrowing gradually to its junction with the stalk. A single compound leaf may measure as much as twenty inches across, and be supported by a stalk nearly a foot long—an admirable sunshade. In the fall the several leaflets, as with the Ash, often separate singly, leaving the long stalk still attached to the tree.

The flower cluster is pyramidal on a central branched stalk. The flower petals are white, with markings of yellow and splashes of red and purple, crisp and crimped. The stamens, when mature, project, curving upwards, and are tipped with red. Cross fertilisation is provided for. In some flowers only the stamens mature, in others the stigma only, whilst in those that develop both, the stigma is receptive before the stamens yield



COMPOUND LEAF OF HORSE CHESTNUT.



HORSE CHESTNUT : THE FALL OF THE LEAF.





HORSE CHESTNUT IN SUMMER.

their pollen. Only those near the base of the cluster produce fruit. In each flower is good store of nectar so disposed as best suits the convenience of the humble bee, whose services are thus requisitioned for the conveyance of the pollen.

The fruit is a rounded prickly ball. It opens along three lines, exposing one to three large seeds, rounded, richly coloured, polished and veined, as jewels embedded in pillows of creamy satin.

## XVII

### THE LIME

THE Lime, or more correctly the Linden, also lays great claim to our regard. Its nobility as a tree is as marked as is that of the Horse Chestnut, but of a less sturdy nature. It may stand alone, the embodiment of gracious stateliness. It is, however, seen at its best when associated with others of its kind to form the arched avenue, making covered way from the wide parkland to some "stately home," or leading up to the great cathedral. With equally fitting and more gentle grace it is often found roofing the path that joins lych gate and porch, in the approach to some rural house of prayer. For there is about the Linden Tree a subtle element of sympathy, that is quickly responsive to what is deepest and highest in our human feelings and interests.

In winter, this tree, with tall, central

column, bearing an abundance of slender branches and twigs, can scarcely be mistaken. The lower branches often present an angular or elbowed appearance. The tree margin shows close-set, fine division and interlacing. The base of the bole is frequently beset and hidden by crowds of shoots. The twigs and buds, more brightly red than those of any of our larger trees, give to the Linden at this season a glow of warmth. In spring this colour deepens with the increase of sunlight ; but not until the year is well advanced do the buds expand, putting forth their drooping canopies of lustrous green.

Not until summer is here have the new shoots expanded, bearing, horizontally, their two rows of fully opened leaves of cheerful green. And not until midsummer do the flower buds appear, beneath the still protecting sprays of foliage, in little ranged groups, as pearly pendants ; opening out under awning of spread fairy wings, into sweet bell clusters, whose tinkling might be audible to fancy but for the all-pervading other melody, of insect wings and insect

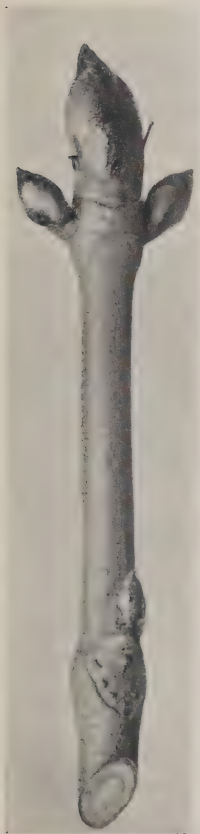
voices, stirring the scented air to incalculable vibrations.

With autumn, changes quickly supervene, for the Lime is of tender nurture. Leaves soon begin to yellow over; fruits formed, but with us seldom ripened, sail away, bearing no promise with them, their high purpose frustrated under hard circumstance. By mid-autumn the Limes are bare, gleam of twig and bud alone abiding out of all their short-lived fairy frolic.

The bark is but slightly roughened into narrow vertical furrows. The twigs are cylindrical, and take a zigzag course. In colour they are a brilliant red, merging into greenish grey. The buds are arranged alternately on these; they are stout, red as the twigs, and bulging on one side. The leaf-scar is crescentic, and has three curved leaf-traces.

The leaves are broadly heart-shaped, with one side somewhat enlarged. They have a single midrib, with branching side ribs. The lowermost of these side ribs, strongly developed and themselves branched along the under side, start at the point of

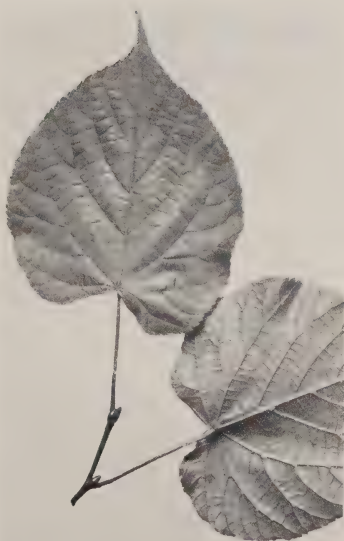




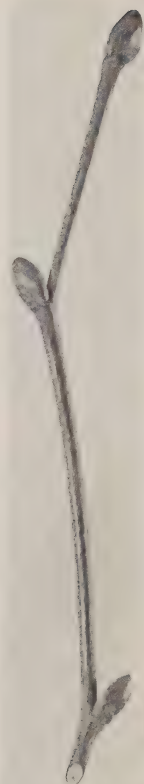
WINTER TWIG OF  
HORSE CHESTNUT.



RESTING BUD  
(ENLARGED) OF  
LIME.



LIME LEAVES.



WINTER TWIG  
OF LIME.



TRUNK AND BARK OF HORSE CHESTNUT.



TRUNK OF LIME NEARLY HIDDEN BY ITS  
OWN SHOOTS AT THE BASE.

junction with the leaf-stalk. The margins are regularly and sharply toothed, except in the depression of the base, where are no teeth.

The flowers grow in a small bunched cluster. This cluster depends from the centre of a specialised leaf (or bract), which overhangs like a protecting wing. This, being light in colour, helps to make the flower group more conspicuous. Each flower has small petals, yellowish white, and crowds of elongated stamens. The stamens mature and shed their pollen before the stigma is receptive. Hive bees are the chief agents in conveying the pollen, and with the Limes in bloom comes to the bee-keeper one of his chief harvests.

The fruit is a small cluster of rounded nuts, still attached by its main stalk to the centre of the overhanging bract. The cluster comes away whole, together with the bract, which now serves as a wing, or sail, in aid of flight.

There are three chief varieties of this tree grown in Britain, respectively described as the Small, the Intermediate, and the

Large-leaved Lime. This may be taken here as sufficient indication of their most distinguishing feature. That with intermediate-sized leaves is the kind most common with us.

## XVIII

### THE PLUM AND CHERRY GROUP

THIS group, and that of the Apples and Pears which follows, are classed together by botanists as belonging to the order of the Rose. The trees of this order give to our spring-time its character of luxuriant blossoming. What we should miss lacking their wide-flung masses of white and cream and rose, on hedgerow and by the wayside, over the broad common-land or by the woodland border, not to speak of the acres of bloom concentrated in orchards of Plum and Cherry, Apple and Pear, it were hard to say. The bounty of the autumn, too, is largely of their bestowal, in weighted branches of ranged or clustered fruits, in purple and orange, gold and ruby.

Some characteristics possessed in common by these trees may here be mentioned. Their flowers, separate or clustered, are



complete, having both stamens and pistils. Bees, moths and other insects are the agents for carrying the pollen; these flowers are therefore made conspicuous by white or tinted petals, and they are rendered especially attractive by their scent, and by their store of nectar. Their seed is produced in the form of a kernel enclosed in a hard, stony shell, or as a "pip" possessing a firm coat and enchambered in a parchment-like walled cell, the stone or pip being embedded in a mass of edible pulp. The fruit, so constituted, is rendered conspicuous, when ripe, by vivid colouring, and is particularly alluring to birds and animals, which are in the main the agents for its distribution.

A useful point of distinction between the two groups indicated above is found in the fact that, with the Plums and Cherries, the fruit is formed within the cup of the flower, above the green calyx, which falls with the petals; whereas the fruit of the Apple and Pear, and the trees associated with them, is formed at the top of the stalk beneath the calyx. Here the calyx does not fall, but remains attached, in the



LIME IN WINTER.



BLACKTHORN IN BLOOM.

form of a dried rosette, at the top of the fruit.

*The Blackthorn, or Sloe.*—This may rank as a small tree but is usually a bush, and not unfrequently merely a constituent part of the hedgerow. It is most noticeable in early spring, when its dark twigs seem almost black in contrast with the porcelain whiteness of the flowers. The chilly beauty of these, with no softening background of foliage, seen only against Blackthorn twigs, and at a time when east winds chiefly prevail, seems to lay emphasis on the harshness of this particular time of year, known for that reason as "the Blackthorn winter." The late P. G. Hamerton said: "A single Blackthorn can chill the edge of a forest."

The twigs are stiffly branched, and strongly armed with thorns. The buds are arranged spirally on these. They appear often in groups of three. Each little bud is rounded and blunt. The buds are crowded on the short spurs. The leaf-scar is elliptical. The leaves are oval, pointed at the base and at the tip, with their margins evenly and

finely toothed. They have a strong midrib, but the six or eight pairs of secondary ribs are weak. The autumn colour of the leaves is yellow to reddish. The flowers grow singly on short stalks, but in close ranks, and appear before the leaves. Looked at closely, each flower is very beautiful, with its pure white petals, upholding, as it were, the central expanding tuft of stamens, each of which is topped as with gold. The fruit is nearly round, like a small black grape, but standing single and erect, and covered with a waxy bloom. This bloom is easily rubbed off, and has generally disappeared by the time the fruit is ripe.

*The Bullace.* — The Bullace may be regarded as a variety of the Blackthorn. The following points may be noted for comparison :

The twigs are stouter and downy. They have but few thorns. The buds are longer and pointed, downy also. The leaves are somewhat broader, with larger serrations. The larger flowers grow in pairs, and open both before and with the leaves. The fruit





HAWTHORN IN BLOOM.



SCATTERED MASSES AND MOUNDS OF "MAY."

is more oval, larger, sometimes yellow in colour. It hangs down from the twig.

*The Wild Plum.*—The Wild Plum is probably a mere escape from cultivation. The twigs are greenish to brown, and smooth. There are no thorns. The buds are large and pointed. The leaves are shorter and broader, and of rougher texture. The flowers are greenish white. They grow in pairs, and appear after the leaves. The fruit is oval in shape, pendent on longer stalk, and approximates to that growing in the orchard.

*The Gean, or Common Cherry.*—Whether our thoughts run to Cherry blossom or to “Cherry ripe,” there is no question as to our interest in this tree. Mr. Meredith, thinking of the blossom, names the Wild Cherry, “Vestal of the forest.”

In winter the tree shows strong, ascending branches, with erect twigs and a considerable number of dwarf shoots crowded with buds.

In spring, leaves and blossoms come out together. Viewed at a distance, the leaves

are quite hidden by the flowers, which are of a soft pearly white, and very translucent. Spenser's vision of Hope might well take form here as applicable to the Cherry tree in bloom :

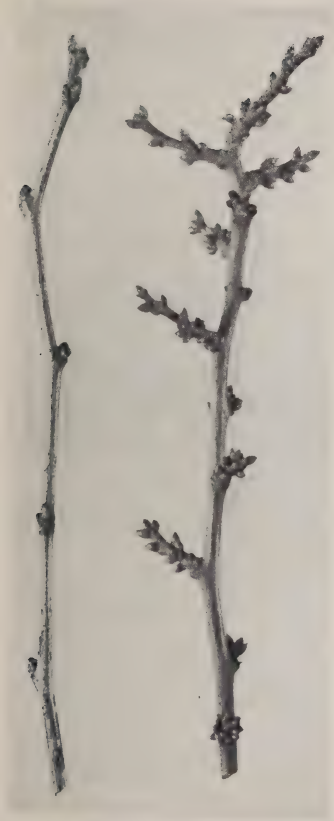
“ In silken samite she was light arayd,  
And her fayre lockes were woven up in gold.”

For, looked at closely, the delicate purity of the blossom is sustained by the rich, reddish brown colouring of the young leaves.

In summer the large pendent leaves, growing often in tufts, and of a fine matt green, make a strong foil for the drooping clusters of red, or red-black, fruit. But the fruit quickly disappears before the eager raids of the blackbirds.

In autumn the leaf tints are striking and varied, making a rich display, with yellow and orange, pink and red, crimson and brown, all harmoniously intermixed.

The bark is very distinctive, rough with deeply-cut downward fissures, but also showing satiny patches scored with transverse lines, after the manner of that of the Birch.



BUDS OF BLACKTHORN ON LONG  
SHOOT AND ON SPURS.



RESTING  
BUD OF GEAN  
(ENLARGED).



FOLIAGE AND FLOWER  
BUDS OF GEAN.





GEAN IN BLOOM.

These patches of bark scale off, curling up at the edges and separating along the transverse lines.

The twigs are erect and stout. The buds are large and pointed. They are brown in colour, and are protected by numerous overlapping scales. They are arranged spirally on the twig and stand upon prominent leaf-bases. The flower buds are round; the leaf-scars are nearly triangular. The leaves, on long stalks, hang with their points down. The margins are doubly toothed. At the top of the leaf-stalk, near its junction with the leaf, are two little red glands. The flowers grow singly, each on a long stalk; a number of these stalks emanate from a single point in the twig, giving to the flowers a bunched appearance. At the base of the flower-stalks are a number of membranous bracts. The fruit is heart-shaped.

This tree, like the Birch, is very subject to the growth known as the Witch's Broom.

*The Dwarf Cherry.*—This is merely a bush or shrub. The following may be noted for

comparison. The twigs are slender and drooping. The buds are smaller and blunt. The leaf-scar is half-moon shape. The leaves are not pendent, and have shorter stalks. They are harsher in texture, and their autumn colouring is less varied, being chiefly yellow and red. The flowers have harder petals. At the base of the flower-stalks are some small green leaves. The fruit is globular and more juicy.

*The Bird Cherry.*—This is a small tree found chiefly in the North. The twigs are stiff and erect. The buds are large, conical, and sharply pointed. They are pressed up against the twigs, round which their points curl, suggestive of a continuous spiral. The bud scales at the base are brown, those near the tip are yellow. The leaf-scar is oval.

The leaves are broad, elliptic, having a larger side. Their surface is rough. The margins are finely toothed. In autumn the colour changes to greenish yellow and red. The flowers grow in a tasselled spray, after the manner of those of the Laburnum, having



LEAVES OF BULLACE.



LEAVES OF BIRD CHERRY.



BLACKTHORN LEAVES.



LEAVES OF GEAN.



a central pendent stalk, with numerous branches, to each of which a white blossom is attached. The fruit hangs by the same central stalk, and forms a cluster like a sparse bunch of small black-currants.

## XIX

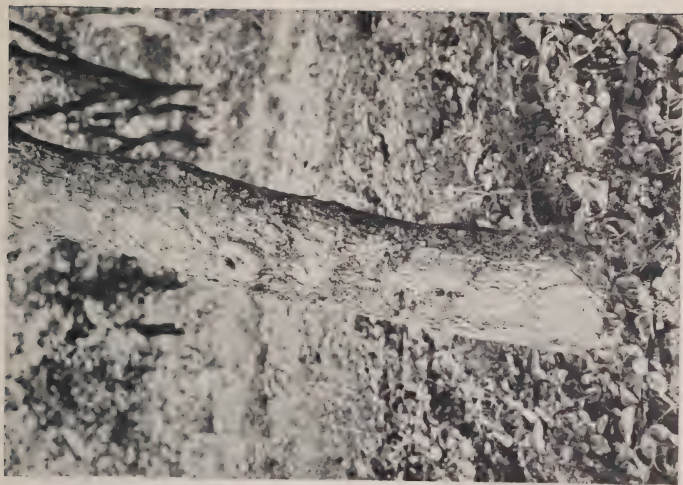
### THE APPLE AND PEAR GROUP

THIS group, as already stated, is closely allied to that of the Plum and Cherry, being of the order of the Rose. In the trees of this group the fruit is formed beneath the calyx, which, as a dried rosette or crown, remains attached till the fruit is ripe.

*The Crab or Wild Apple.*—The usual habit of this tree is to divide into branches rather low down. These spread outwards and upwards somewhat irregularly, so that the crown is low and rounded. There is often considerable density in the lesser branching, suggestive of a thicket of shoots and twigs. The sight of the Apple tree in full bloom, whether wild or under culture, fills one with a kind of amazement. The mass, the fullness, the warmth of colouring, its suggestive sweetness, set this tree apart



TRUNK AND BARK OF GEAN.



TRUNK AND BARK OF APPLE TREE.



AN APPLE ORCHARD IN BLOOM.

from all others. It seems to crown the floral beauty of the season.

The greyish brown bark is scaly. The twigs are smooth, and of a reddish brown. There are many dwarf shoots with ringed scars. The buds are small, and protected by scales on which are some whitish hairs. The leaves vary in form from a rounded to a long oval. They show distinct serrations along their margins, and have pointed tips. Five or six pairs of strong secondaries branch off from the midrib and curve forwards, but they soon divide. The flowers grow singly on short stalks, several of which emerge together at the tips of the dwarf shoots, or spurs, and, spreading outwards, form bunched clusters. The five petals to each flower are pink and white, and within the cup formed by these is a circular group of many stamens, each with a creamy yellow head, erect after the second day of opening. The familiar rounded fruit shows always a distinct depression at the base where the stalk enters, as well as at the top where the calyx is still attached. The firmly coated brown seeds, or " pips," in pairs, are disposed



in five separate walled cells, which constitute the Apple's "core."

*The Wild Pear.*—This is not a common tree, and is probably often a mere escape from cultivation. In comparing it with the Wild Apple the following details may be noted.

The shape of the tree is usually taller and less spreading. The branching is more open, and with less entanglement of the twigs. The bark is more distinctly furrowed, and less inclined to flake off in scales. The twigs are a yellowish brown, and are without hairs. The buds are hairless. The leaf-margins show only ill-defined serrations. The venation of the leaves is less distinct, the secondaries, though more in number, are weaker and more sinuous, the whole system breaking up into a more or less complete network of nerves.

The flowers are, with rare exceptions, pure white. They open about ten days before those of the Apple. They are grouped in more distinct and more open bunches. The many stamens stand erect from about

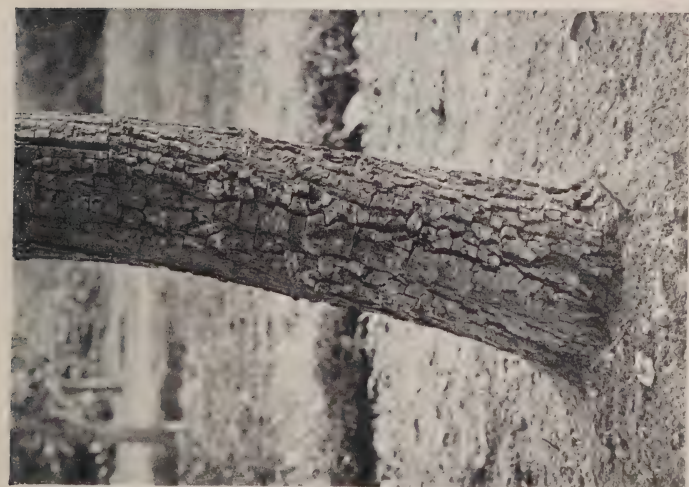
the third or fourth day after the petals have expanded, and their tops are a dark purple. The fruit, notwithstanding our familiar use of the term "Pear shape" as a descriptive epithet, is frequently round, but it may be readily distinguished by the absence of any depression at its base. Moreover, the substance of the Pear has always a gritty admixture, instantly recognised on cutting or biting.

It will be convenient to regard the next three trees as forming a sub-group. Their flowers, which are small and white, or creamy white, are borne in branched clusters, in such a way that the flower heads arrange themselves more or less in a single plane. The fruits, popularly spoken of as berries, are like miniature Apples, varying in colour according to the kind ; they are grouped in the same manner as the flowers. They enclose but few seeds.

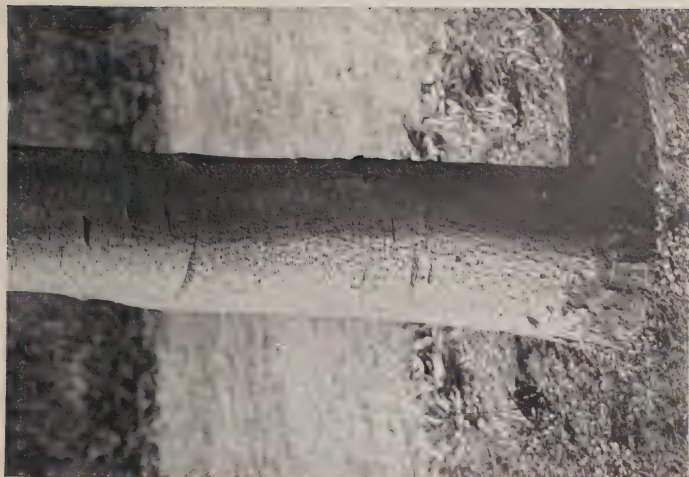
*The White Beam.*—The White Tree—for "beam" is the Saxon equivalent for tree—is aptly characterised by its name. Seen in its

accustomed haunts, on the borders of the wood, or on the slopes skirting the chalk downs, it cannot be overlooked or mistaken, a mound of greeny whiteness in conspicuous contrast to its surroundings. It varies much in habit from a small shrub to a fairly large single-columned tree; though it most frequently, perhaps, appears as a considerable bush-like tree, with several strong stems spreading upwards from the base.

The grey bark is at first smooth, having dots arranged in short transverse lines. This eventually becomes rough. The twigs are stout, and shining, brown to grey in colour. The buds, spirally arranged, usually stand out from the twig. They are protected by scales, which are green with brown margins. The leaves vary in shape, and have a tendency, more or less decided, to divide into pointed sections, with double serrations on the margin. When young they are grey. On first emerging from the bud they stand up like small grey, or white, pinnacles. After full expansion the upper surface becomes gradually a deep shining



TRUNK AND BARK OF WILD PEAR.

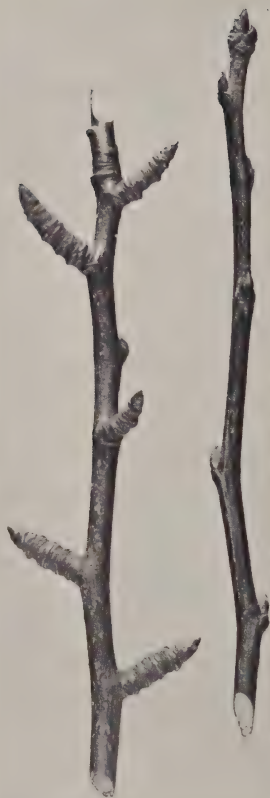


TRUNK AND BARK OF WHITE BEAM.



1

WINTER TWIGS (1) OF APPLE, (2) OF WILD  
PEAR, SHOWING BUDS AND DWARF SHOOTS.



2



WINTER TWIG  
OF WHITE  
BEAM.



green, but the lower surface remains white, being coated as with thick felt. It is this under-surface whiteness, lifted and displayed by the wind, which gives to this tree its distinctive character and name as the White Beam. The calyx and stalks of the flowers are coated with this same white felt. The petals of the flowers are white, as are also the tops of the stamens. The fruit is nearly globular, and its colour is scarlet, often dotted with brown.

As a shrub the White Beam may be distinguished with certainty, from the rather similar shrub known as the Way-faring Tree, by the spiral arrangement of its buds and leaves. Those of the Way-faring Tree are opposite.

*The Wild Service.*—This is a tree of very local occurrence, and chiefly in the southern counties. The grey bark is decidedly scaly. The buds are nearly round, shining, and green in colour. There are narrow brown margins to the scales. The leaves are cut into from five to seven pointed divisions, each of which is supported by a strong secondary rib.

The venation at the base recalls that of the Plane. The leaf-margins have saw-like teeth. The flowers are more loosely branched than those of the White Beam. The fruit is oval, brown in colour, with lighter spottings.

This is one of the earliest of our trees to assume its autumn tints, showing golden and brown shades among the green, often before the summer is gone.

A tree, usually distinguished as *the True Service*, is occasionally to be met with in park or garden. It bears less resemblance to the Wild Service than to the Rowan or Mountain Ash, for which it might easily be mistaken at first sight, as it has the same habit and similar foliage. A closer examination will at once reveal decided differences. The bark is like that of the Wild Service, rough and scaly from the first. The twigs are smooth and shiny. The buds are green, smooth, and slightly sticky; they stand out from the twig. The leaves, so like those of the Rowan, have broader leaflets, and these have marginal teeth near the tip only. The flowers, of a creamy white,



2



LEAVES OF

- (1) WILD SERVICE,
- (2) HAWTHORN,
- (3) WILD APPLE.

1

3



TRUNK AND BARK OF ROWAN.



LEAVES OF ROWAN.

are larger than those of the Hawthorn. The fruits, clustered two or more on a single main stalk, may be round or Pear-shaped. They are green, or reddish, with brown spots; are almost as large as Crab-apples, and have a like depression at the base.

*The Rowan, or Mountain Ash.*—We have here one of the hardiest and most adaptable of our trees. Its natural preference is for the wild moorland, but it penetrates into the fastnesses of the mountains, and is found in Scotland at an elevation of 2,600 feet above sea level. Yet it can fraternise with the Alder in the water meadows, and flourishes in thousands of suburban gardens. It is seen at its best, at all seasons, in the neighbourhood of the Pines, or upstanding with the Birches among the bracken and heather. It is never more than a small tree, and its branches ascend in rather loose order. The moderate quantity of feathery foliage carried by the branches give it an easy grace, an airy lightness.

The bark, which is grey in colour, is



smooth at first, and marked with transverse lines as that of the Wild Cherry. Later it becomes thickened and furrowed. The twigs are short, slightly velvety, and range in colour from grey to brown. The buds are large, pointed, pressed up against the twig, distinctly velvety, and purplish black or grey. Should doubt arise with respect to this tree it may be distinguished from the Ash by the spiral arrangement of its buds. The leaf-scar is long and narrow, showing five leaf-traces.

The leaves are compound like those of the Ash. It is from this fact that this tree has acquired the somewhat misleading name of Mountain Ash, for the Rowan and Ash are not related. Each leaf consists of from five to nine pairs of leaflets, with a terminal one. The margins of these are toothed like a saw. The flowers are Hawthorn-like, but of smaller size individually, and borne as previously indicated. The fruit clusters are brilliant with a colour all their own, a vermillion shade of red, which gives to this tree from late summer onwards, so long as the birds will permit, its most distinctive charac-



LEAVES OF WILD PEAR.



LEAVES OF WHITE BEAM.



TRUNK AND BARK OF WILD SERVICE.



TRUNK AND BARK OF HAWTHORN.

ter. Blackbirds and thrushes swallow down the fruit in wholesale fashion, so ensuring for its contained seeds an abundant and wide dispersal.

*The Hawthorn, or Whitethorn.*—On every side is the Hawthorn, in the season of its blossoming, extending along the borders of the fields like rolling masses of sea-foam; scattered over the commons and up the hill slopes in mounds and wreaths; possessing all the land with the wonder, all the air with the fragrance of the “May.”

Growing as a small tree it presents a rounded crown, with great crowd and entanglement of branch and twig, which, through the summer, support close density of shadowing foliage, beloved of many wild birds for the hiding of their nests. The dull grey bark of its often fluted main stem is roughened into closely set furrows. The twigs, which are dull brown, or silvery grey, vary from long shoots with buds and leaves apart, to short shoots with buds placed closely, and leaves gathered into tufts. These

short shoots end in sharp thorns. Thorns are also found on the long shoots, rising out of these at the points of junction with the leaf-stalks.

The name Hawthorn, which is simply Hedgethorn, denotes the fact that this, of all growths, has come most into use in the formation of live fences. Easily propagated by cuttings, well enduring the shears, dense with crowded twigs and thorns, it speedily becomes an impenetrable barrier.

The leaves are extremely variable. They show from three to five, or seven, main divisions, some of which are cut down nearly to the midrib. At the base of the leaf-stalks on the long shoots are leaf-like expansions (stipules), which here have the appearance and serve the purpose of supplementary foliage. In autumn the leaf colouring shows great variation and range—yellow, red, bronze, and purple.

The flowers are generally white, as those of the Blackthorn, but their whiteness is softened by the fresh greenery of the associated foliage, and by the many pink or



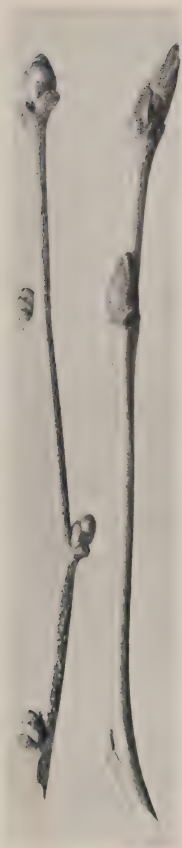
purplish heads of the enclosed stamens. The brightly-coloured "haw," though on a greatly diminished scale, is apple-like in outward appearance, but it differs from the produce of other trees in this group, in that it is in reality a stone fruit.

## XX

### THE ELDER

THOUGH generally seen growing as a somewhat straggling bush, the Elder not infrequently becomes a small standard tree. It is common in all the country-side, but it seems to have a special preference for the neighbourhood of human habitations. This may be due to the regard in which it has been held as the possessor of certain medicinal and other virtues. It may be due to use and custom, but it always seems to strike a homely note in our landscape, and, whether seen in full flower or in berry, it wins a kindly notice.

Its habit of branching is very distinctive. As a rule several stems rise from the base, and these bend over, drooping at the tips. Along these, especially at the supreme curve, rise other upright stems, which likewise bend over. Many similar shoots also rise upright



1

2



3

WINTER TWIGS OF (1) WILD SERVICE, (2) ROWAN,  
(3) HAWTHORN.



THE ELDER IN SUMMER.

from lower down on the main stems, at short distances apart, like whipstocks. The branching, besides being irregular and straggling, has the appearance of cross-hatching, and is in parts overcrowded.

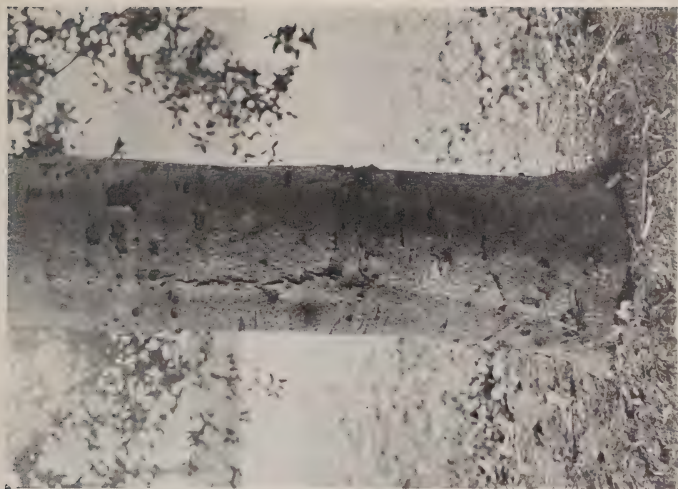
The bark, with age, becomes rough and deeply furrowed ; its colour is a yellowish brown. The twigs are a pale greenish grey marked with distinct patches of yellowish brown, indicating the presence of numerous breathing apertures. Twigs and shoots have but a thin outer woody coating, all within being soft pith. The buds are arranged upon these in opposite pairs. They have a few loose scales at the base, above which the tips of the young leaves are seen as green unprotected tufts throughout the winter. The leaves are compound, made up of from two to five pairs of leaflets with a single terminal one. These leaflets are oval and pointed, having their margins rather coarsely toothed. The flowers are individually small, with five creamy white petals. They are made conspicuous by their grouping into a rounded flat extension, which suggests a platter upheld on a five-branched support.



They secrete no nectar, but are much visited for their pollen by many kinds of flies, to whom their rather disagreeable scent is evidently an attraction. The fruit, upheld in the same way, and grouped as the flowers, takes the form of a stone fruit, small, round, having three stones embedded in its juicy pulp. It is eagerly swallowed by numbers of small birds, and in this way its contained seeds are effectively dispersed.



TRUNK AND BARK OF ELDER.



TRUNK AND BARK OF HOLLY.



ELDER LEAVES.



ACACIA LEAVES.



LABURNUM LEAVES.

## XXI

### THE HOLLY

THE Holly can never be mistaken, whether met with as hedge, bush or tree. Its use in our Christmas decorations has assured that. It may be found by almost every wayside, and is often abundant as woodland undergrowth. It is most distinctive when other trees are bare of leaves, but not only for the fact that its leaves remain. Its ripe, red, coral-like berries, crowded on the twigs amongst its rich green, varnished foliage, render it conspicuous at this season, spreading a rich glow of colour in striking contrast to the wintry surroundings.

The bark is smooth, ashen grey in colour, recalling that of the Beech. The leaves, dark green and polished, thick in substance, hard and leathery in texture, are typical evergreen leaves, adapted to withstand and endure the stress of winter. Their margins

are plentifully armed with sharp spines, and as the leaves are spirally arranged on the twigs, and moreover as each leaf-blade curls and twists, these sharp points are presented in every direction, thus affording a sure protection against browsing cattle. They are however, no defence against cropping by deer. There is a noticeable tendency to forgo this defence on the higher branches, where the necessity for it is lessened by their being out of reach. This cannot, from the evidence afforded by our native Hollies, be defined as more than a tendency.

The small flowers, having four creamy petals, are crowded together at the bases of the previous year's leaf-stalks. They are, as a rule, incomplete, having only rudimentary stamens or pistil, but the flowers on each tree are usually in agreement. In consequence of this some trees display no winter crop of berries. The fruit, however, is not a berry. It is a stone fruit with four stones. As the bright colour and pulpy substance of the fruit would lead us to expect, the seeds in their hard shells are dependent upon the birds for their dispersal.

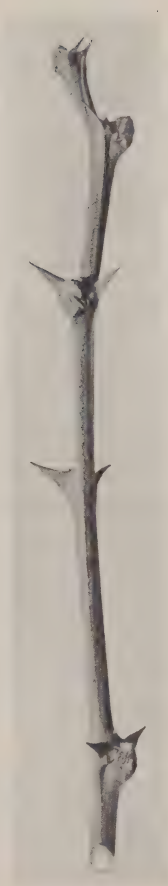




A HEDGEROW HOLLY.



1



2



3

WINTER TWIGS OF (1) IABURNUM, (2) ACACIA, (3) ELDER.

## XXII

### THE LABURNUM

THE pea-pod tribe of plants is one of the most extensive. It includes, amongst herbs, the peas and beans, the vetches, the clovers, and many others; amongst shrubs, the broom and gorse, and amongst trees the Laburnum and Garden Acacia. It is not only distinguished by its fruit, but also by its flowers. These, with modifications, may be described as having wing-like petals, suggestive of a butterfly's wings, and boat-like petals, which by the union of two constitute a very fair representation of a boat's keel. An examination of these flowers, and comparison of one kind with another, are of special interest as showing the various adaptations and devices by which their fertilisation by insects is governed and accomplished.

The Laburnum, so common as a small

tree in gardens, can never be mistaken when in bloom. Its branches, curving with the weight of their drooping yellow tassels, suggestive of "golden rain," make it familiar and a favourite. It is not a native tree, but it is completely naturalised. Yet it is seldom, if ever, found growing wild. This is the more remarkable from the fact that its seeds readily germinate, and its seedlings spring up freely as garden weeds. A suggested explanation is that, in the open, these seedlings never escape the attention of the rabbits, to whom they prove a dainty morsel.

The bark is smooth, eventually peeling off in transverse strips. The twigs are green, becoming greyish as their outer skin flakes off. The buds are arranged spirally on the twigs. They have three scales, and are coated with silky hairs. The leaves are compound, having three leaflets. These are elliptical in shape, and without marginal teeth. Their under-surface is pale and silky. They are attached by very short stalks to the end of a long main stalk, so they are dispersed rather loosely along the shoots;

but as dwarf shoots are very numerous the leaves in many places appear tufted.

The flowers are congregated in the form of clustered tassels. These droop gracefully, but each individual flower, when expanded, stands out horizontally in a manner best suited to a bee's alighting. Their colour is a golden yellow, but in one variety they are pink or purple. Two dark lines on the upright petals serve as guides to the concealed nectar. The fruit is in the form of a yellow or brown pod. Several of these are attached to a single stalk, and several stalks form a cluster, which remains on the tree all through the winter. When ripe the pod opens, splitting lengthwise, and the black seeds escape.



## XXIII

### THE ACACIA

THIS ornamental and interesting tree is sadly in need of a name. As the result of one error it has been named Acacia, and of another Locust Tree. Botanists speak of it as False Acacia, which is simply libellous. Acacia "falsely so called" would be more correct. White Laburnum is misleading, and Garden (or Gardener's) Acacia is almost equally so.

A considerably larger tree than the Laburnum, it has much in common, particularly in respect of its flowers and fruits. The bark, which is brown in colour, becomes deeply furrowed and uneven, having raised ridges forming a lattice-like pattern. The twigs are olive to brown. The buds, arranged spirally, are entirely hidden in a large angular leaf-scar which lies between two projecting spines. The compound leaves consist of



LABURNUM IN SUMMER.



TRUNK AND BARK OF LABURNUM.



TRUNK AND BARK OF ACACIA.

from five to twelve pairs of leaflets with a terminal one. These are oval in shape and without marginal teeth. They are thin in substance, smooth in texture, of a bright green above, bluish below. Like the leaflets of the Laburnum, the clovers, and some other plants of this order, they close one over another, and become pendent at night, suggestive of sleeping. The purpose of this is to lessen transpiration and consequent chilling.

The flowers are white, fragrant, and hang in pendent tassels, after the manner of those of the Laburnum. They provide abundance of nectar. One variety has yellow, another rose-coloured, flowers. The fruits are dark red, flattened pods, containing six or more seeds.

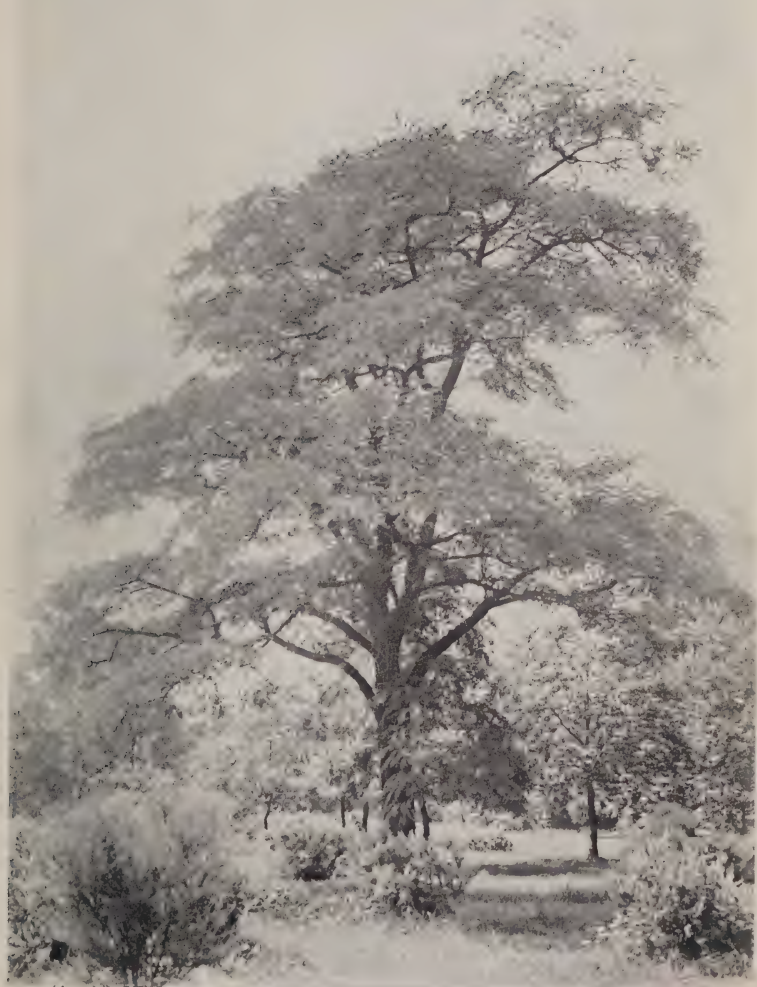
## XXIV

### CONIFERS: THE FIRS

THE trees included under the general title Conifers form a very large and important class. Their character is so distinctive that they stand apart from all others.

Nearly all of them are evergreen, their leaves remaining attached for a series of years. A notable exception is the Larch. The nature of these long-persisting leaves has undergone special modification with a view to their endurance through extreme variations of temperature and climate. As a consequence of this modification these trees can live and thrive in exposed situations, braving the winds, unharmed by the snow, where other trees would suffer rending and maiming. In texture these leaves are hard and leathery; in shape they are long and very narrow, exposing but the smallest surface, reducing transpiration to a minimum,





THE ACACIA IN SUMMER.



SPRUCE FIRS.

offering least resistance to the wind. They can withstand burning heat or biting frost. The little surface that is exposed is smooth and shiny, and from it the snow slips off before its accumulation becomes a peril.

Their flowers are crowded together, in the shape of spikes or cones, which again may be grouped into clusters; but each cluster comprises one kind of flower only, which is either pollen-bearing or fruit-producing. These are generally found on the same tree. The quantity of pollen thrown off is enormous, floating away in clouds, settling and forming drifts in places, giving rise to the frequent country legend of a sulphur shower. Conifers rely upon the wind alone for the conveyance of the pollen, and the abundance of this is a precaution against failure. Under the microscope each pollen grain is seen to possess two air bladders in aid of flight.

Their fruits are, with exceptions, the familiar woody cones. These are made up of hard scales spirally arranged round a central axis. These scales overlap like tiles, being further made secure by a resinous glue.

Enclosed and protected by these, the seeds mature, two in each scale-roofed chamber, till such time as they are fully ripe. Eventually the scales relax, in some instances gaping open, in others separating and falling, to set free the seeds, which, being winged, are wind borne and dispersed. But some Conifers, as the Yew and the Juniper, produce not cones but stone-fruits, having their seeds surrounded by or embedded in an edible pulp.

All the Conifers which will come under notice here, with the single exception of the Yew, belong to the Pine family. This includes the Firs, with leaves single but crowded on the twigs; the Pines proper, with leaves in bundles of two, three, or five; the Larch and the Cedars, with leaves in tufts of twenty or more; the Cypresses, with leaves as close-fitting scales.

The Firs most commonly found are the Spruce, the Silver Fir, and the Douglas Fir. The shape of a Fir tree is pyramidal, having its branches arranged circularly and outspreading, at regular intervals up the main stem, longest below, shortening gradu-





THE DOUGLAS FIR.





AUSTRIAN (1) AND CLUSTER (2) PINE BUDS.



SHOOTS OF CONIFERS.

Spruce.  
Scots Pine.

Douglas Fir.  
Austrian Pine.

Larch.

ally upwards to the leading shoot, which makes the apex of the pyramid. Each unbranched interval on the main stem represents a year's growth.

In distinguishing between the Firs, and for comparison with the Pines, chief attention may be given to the leaves and the fruits. The leaves of the Firs, attached singly, and having the appearance of short lengths of ribbon, are arranged in a close spiral, crowded together, but, as it were, combed out flat on either side of the twig, the object being to get the breathing surfaces underneath. The fruit cones of the Firs have scales of a uniform thickness, whilst those of the Pines show scales having either a central or terminal swelling.

*The Spruce.*—The bark is reddish grey, and flakes off in thin rounded scales. The leaves are short, narrow, and thick, nearly square in section. They appear as if stroked down on to the twig, rather than combed out laterally, and are of a dark uniform green. The glistening brown cones are spindle-shaped, and hang with their points

downwards. They remain on the tree through the winter. Some time in the following summer the cone-scales gape apart, setting free the ripe winged seeds. Later the empty cones fall bodily.

*The Silver Fir.*—The tree becomes less distinctly pyramidal, its top grows bushy and eventually flattened. The bark is a lighter grey, its scales are less rounded, and there is the suggestion of fissures. The leaves are longer, broader, and relatively thinner. Their under-surface is marked along its whole length by a pair of shining silver lines. The leaves are more distinctly combed out. On the fruiting branches, which are always near the summit of the tree, they curve upwards, exposing freely their silvery under sides. The cones are cylindrical and stand erect. Their surface is roughened by spiny projections emerging from under the scales. When the fruit is ripe, in the autumn of the same year, the cone-scales loosen and fall, releasing the seeds. Only a bare central spike remains for a time on the tree.

*The Douglas Fir.*—The bark is thick, reddish brown in colour, and deeply furrowed. The leaves are more delicate in texture. On the horizontal twigs they are so flattened out on either side that they might have been subjected to pressure. Each shows two thin silvery lines on the under side. The cones are egg-shaped, of a light brown colour, and they hang downwards. Lying upon and projecting over each woody scale is a soft fibrous scale in the form of a trident, an ornamentation that gives to these cones a distinctive appearance. The fruit is ripe in late autumn, when the scales gape open, setting free the seeds. The empty cones fall later.

## XXV

### CONIFERS: THE PINES

THE shape of a Pine early in life is pyramidal, but later this symmetry is generally broken. The leaves are long and narrow, aptly characterised as needles. They are not solitary but grow in bundles of two, three, or five, which are confined at the base in a sheath. A Pine cone, after forming, ceases to grow throughout the first year. It starts into growth the following spring, generally maturing by the next autumn. The small swelling, or boss, is always present on the exposed part of each cone-scale. The cones are pendent, and they release their seeds by opening their scales.

*The Scots Pine.*—This is our one native Pine. The mature habit of this tree is to cast off its lower branches, sustaining, on tall stem, a rounded or flattened crown. The



bark near the base thickens, exhibiting a series of dark, flattened plates, separated by fissures ; but higher up, where the thin scales peel off, the general surface is of a bright coppery colour. The needles, two in a bundle, united at the base in a brown sheath, are bluish green. Their length is about two inches. The cones, which are about two inches long, and taper quickly, grow sometimes three together, but generally in pairs, side by side, with their central axes almost parallel. The exposed part of the cone-scale is four-sided, and is thickened to a point in the centre. Its surface is not polished.

*The Corsican Pine*, and its *Austrian* variety, may best be distinguished from the Scots Pine by the following : The bark is fissured and uniformly thick and dark, from the base to the summit. The bud is cone-shaped, with a long-drawn-out point, silvery, and thickly covered with whitish resin. The needles, two in a bundle, and sheathed at the base, are rather longer and of a darker green. The cones also are larger, and as they grow in pairs their attitude is different.

They are attached base to base, with their central axes in a line, or nearly so. They have a polished surface.

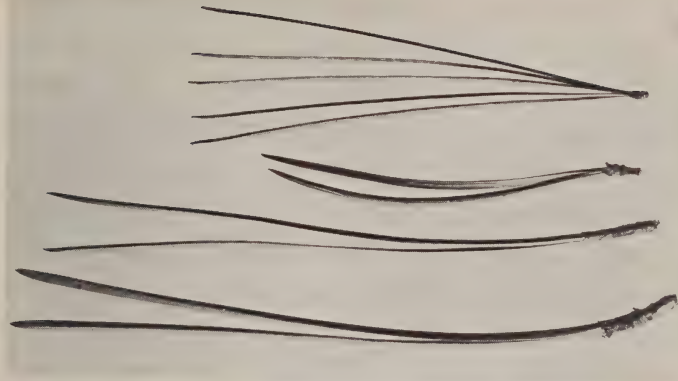
*The Cluster Pine.*—The bark is dark, coarse, and deeply furrowed. The buds, about an inch long, are torpedo-shaped. These are not coated with resin, but the ends of the scales curl outwards. The needles, two in a bundle, and sheathed at the base, are six or eight inches long, and thick in proportion. They are clustered together on the branches and form handsome tufts. The cones grow several together, radiating round the branch. Each cone is about six inches long and unevenly developed, bulging on the exposed side, and curving towards the point. It has a shiny surface. The central swelling on each scale is so pronounced as to give the cone a spiked appearance. The cones often remain on the tree for years. This Pine seems to have special powers of endurance close to the sea.]

*The Stone Pine.*—From its spreading manner of growth this is often spoken of



CONES OF CONIFERS SHOWING ATTITUDE IN GROWTH.  
 1, Spruce. 2, Larch. 3, Weymouth Pine. 4, Douglas Fir.  
 5 and 6, Scots Pine, first year and full grown. 7, Cedar.  
 8 and 9, Austrian Pine, first year and full grown.

1 2 3 4



NEEDLES OF (1) CLUSTER, (2) AUSTRIAN,  
 (3) SCOTS, AND (4) WEYMOUTH PINES.



SCOTS PINES.



as the Umbrella Pine. The bark is reddish grey, thick and deeply furrowed. The buds are conical and have curled scales. The needles, two in a bundle and sheathed at the base, are similar to those of the Cluster Pine. The cones are not clustered, they are nearly globular, their scales are not spiked, but show a raised flat surface with a central depression. They require three years to reach maturity. Their contained seeds are large, suggestive of a fruit-stone, hence the name "Stone Pine." Each seed has a tiny wing wholly inadequate for any purpose of flight. This Pine has, perhaps, in its later evolution, come to rely upon animal agency for the dispersal of its seed.

*The Weymouth Pine.*—The needles here are five in a bundle, sheathed at the base only when first expanded. They are long, very thin, and soft in texture, almost suggestive of hair. These are also crowded together, forming considerable tufts, spreading in summer, but closing together in winter. The cone is long and thin, spindle-shaped, and curved. Its most distinctive peculiarity



lies in the fact that the swelling on the cone-scale is not central, but at the tip.

*The Himalayan Pine* is scarcely distinguishable from the Weymouth variety except that its needles are longer and its cones larger every way.

*Note.*—Other imported Pines are “too numerous to mention,” but those briefly distinguished here are the most frequently met with.



LARCH IN SUMMER.



TRUNK AND BARK OF SCOTS PINE.



TRUNK AND BARK OF SPRUCE FIR.

## XXVI

### CONIFERS: THE LARCH AND THE CEDARS

THE most distinctive feature with respect to the Larch amongst Conifers is that it is not evergreen. For some reason and advantage, it has, in the course of its evolution, acquired the habit, common to most of our trees outside the Conifer group, of casting its leaves as a preliminary to the winter sleep. It is of interest to note that a Larch seedling, during the first four years of its life, is partially evergreen—a surviving reminiscence of the tree's former habit.

The Larch is pre-eminently a tree of the mountain regions. Its shape is pyramidal, after the manner of the Firs. Its comparatively slight branches emerge in no very defined order from a central, tapering stem. These branches have at first a decided downward tendency, but sweep upwards towards their ends. Along them are ranged



many branchlets, vertically suspended, forming a kind of fringe. In winter this tree has a peculiarly desolate appearance, more like that of death than sleep. But in spring there is no tree that awakens, in its vivid emerald robing, to a life more blithe and buoyant.

The bark, which is a reddish grey in colour, flakes off in scales, but also becomes strongly furrowed. The needles are arranged singly and in a close spiral on the young, long shoots, but elsewhere are in spreading tufts. They are of a very pure shining green in spring, deepening later, and changing to yellow before their fall in autumn. In texture they are soft, not hard and leathery as are those of the evergreens. Each needle is flattened.

The flowers, which appear at the same time as the needles, are oval in shape. The pollen-bearing flowers are yellow, the fruit-producing flowers a purplish red, sometimes a pure rose, erect by a manifest effort on the sides of the pendent branchlets. These are what Tennyson refers to as the "rosy plumelets" of the Larch. They are, how-





THE CEDAR OF LEBANON.



TRUNK AND BARK OF THE CEDAR OF LEBANON.



TRUNK AND BARK OF LARCH.

ever, on some trees a greenish white. Since these flowers grow abundantly on the lower branches, and there is, in consequence, no urgent need of the pollen's upward flight, its grains are not equipped with air bladders as is usual with the Pines. The cones, which mature and ripen their seeds in a single season, are about an inch long. Their scales open in the following spring, liberating the winged seeds. These are gradually shaken out by the wind, but not readily, owing to the erect attitude of the cones.

The empty cones remain attached to the branches for several years, and, so accumulating, add much to the desolate winter aspect of the tree.

#### THE CEDARS

THERE are three of these, which are, however, generally regarded as merely geographical varieties. They are all mountain trees, as their names indicate : The Cedar of Lebanon, the Himalayan Cedar (Deodar), the Mount Atlas Cedar.

*Cedar of Lebanon.*—The Cedar of Lebanon, supreme type of venerable majesty among trees, is nevertheless of very variable habit. In its most characteristic form it throws out, at a rather low level, huge lateral limbs which support at their extremities broad, platform-like areas of foliage, giving to the tree its distinctly terraced appearance. In maturity the summit also is usually broad and flat.

The other Cedars, as they grow in this country, are almost uniformly pyramidal, like the Firs. The chief distinction between them is in the fact that, whilst the Deodar has its branches directed downwards, with their terminal shoots pendent, the Atlas Cedar has both its branches and its shoots erect.

The bark, a brownish grey in colour, is deeply broken up and roughened. The needles grow, similarly to those of the Larch, singly on the young, long shoots, in bristling tufts elsewhere. These tufts appear mostly on the sides and upper face of the branch. Each needle is hard and tough in texture, and is four-sided.



The flower clusters, which appear in the autumn, are solitary and erect. Both kinds are found on the same tree. The pollen-bearing flower clusters are particularly conspicuous as yellowish green spikes, contrasting strongly with the expanse of tufted dark green needles. The cones are erect, oval in shape, flattened or bluntly pointed at the top, and of a particularly solid structure. They require two or three years to reach maturity. The seeds are liberated, as in the also erect cone of the Silver Fir, by the shedding of the cone-scales, from the top downwards, leaving on the tree only a bare spike. The seeds are winged.



## XXVII

### CONIFERS: THE CYPRESSES AND THE YEW

IN the Cypresses the leaves have been reduced to mere scales. These are arranged upon the shoots and twigs in opposite pairs, with the alternate pairs at right angles. These fit so closely as completely to ensheath the shoot. The two chief Cypresses with us are the Roman (or Common) Cypress, and the Lawson Cypress.

Their usual form is flame-like, as that of the Lombardy Poplar. The flowers of both kinds are found on the same tree, but on different branches. They are very small, but being grouped more or less at the ends of the previous year's shoots, and of distinctive colour, they are fairly conspicuous. The small cones are globular. They have but few scales, and these of a peculiar shape. Each separate scale is like a large-headed nail. The heads of these scales, pressed

together and become pentagonal by pressure, form the outer surface of the cone. The cone opens, to liberate the winged seeds, by the separation of these heads of the scales. The Thuyas, which otherwise most closely resemble the Cypresses, are easily distinguished by the absence of this peculiarity in the cone-scales, and by the more bud-like appearance of the cones.

*The Roman Cypress* has its branching very close and dense. The shoots and twigs, with their sheathing leaves, are square in section. The pollen-bearing flowers are yellow, while those of the fruit-producing kind are a brownish green. The cones are an inch in diameter.

*The Lawson Cypress* has a looser branching and a more flattened spray. The shoots, closely ensheathed by the leaves, are flattened also. The margins of the leaves are emphasised by waxy lines, forming a series of markings, V or Y shaped. The pollen-bearing flowers are a bright red, the fruit-producing flowers a steely blue. The cones are about

one-third of an inch in diameter. This Cypress, though of recent introduction, is the one now most commonly met with, being generally planted because of its quicker growth.

#### THE YEWE

EVEN apart from its associations this tree cannot be overlooked. Its rounded massive build, its dark evergreen foliage, its columned trunk, often of immense proportions, its air of antiquity, distinguish it instantly from all other growths. It is venerable from its association with ancient forms of worship, from its frequent occurrence in near neighbourhood of old church buildings, having, it may be, possessed the ground long before their walls were raised. The imagination is stirred at the thought that, without one hour's cessation, through all seasons and all changes of a thousand years and more, many an ancient Yew, vigorous still, has laid its quiet shadow on its own peculiar spot of sacred earth.



THE YEW.



TRUNK AND BARK OF YEW.



The trunk is really a composite structure. Branches growing up from the base have, in course of time, coalesced with the main stem, giving to it its columned character. The bark, which is thin and fibrous, peels off. It is reddish brown in colour. The flattened narrow leaves, solitary, and arranged in a close spiral, assume a combed-out attitude after the manner of those on the Firs. The pollen-bearing flowers, prepared the previous autumn, are attached in clusters to the under sides of the twigs. They are like rounded yellow beads. Their ripened pollen drifts away in clouds when a branch is shaken. Like those of the Larch, and for a similar reason, these pollen grains have no air bladder attachments. The fruit-producing flowers, with very rare exceptions, are on separate trees. They are difficult to find, being, in appearance, no more than minute green buds, whose floral structure can only be seen under the lens. The fruit is an olive green seed with a hard shell, partially enclosed, like a young acorn in its cup, within a brilliant scarlet receptacle, the walls of which contain a sickly-sweet mucus.

Numerous birds find this attractive, and by their agency the seeds are dispersed.

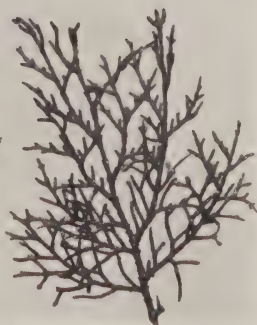
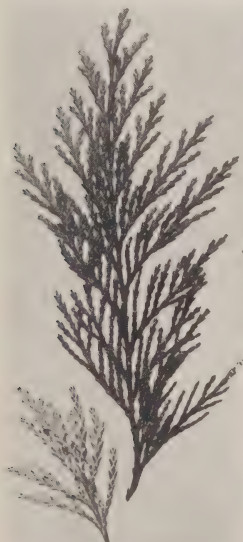
A variety of this tree, the Irish Yew, frequently seen in gardens, is of columnar shape.



FOLIAGE OF CEDAR  
OF LEBANON.



FOLIAGE OF YEW.



FOLIAGE OF LAWSON  
CYPRESS (LEFT) AND  
ROMAN CYPRESS.



THE ROMAN CYPRESS.

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## LIST OF FLOWERS NEEDING SPECIAL PROTECTION

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1. Bloodroot.
2. Cardinal flower.
3. Columbine.
4. Dogtooth violet.
5. Dutchman's breeches.
6. Fringed polygala.
7. Gentian.
8. Hepatica.
9. Lillies.
10. Mayflower.
11. Pitcher plant.
12. Spring beauty.
13. Trillium.
14. Yellow violet.
15. All lady's slippers and all other orchids.

Take great care never to set fires in the woods and clear up all rubbish when picnicking, that others may enjoy the woods as well as you.

For further information apply to the Secretary of the Society for the Preservation of New England Plants.

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Boston, Massachusetts

Tel. Back Bay 6469

(Over)

**T**HERE is danger of extermination of many interesting and beautiful wild flowers through thoughtless and indiscriminating picking. Those flowers which are gathered for sale are in especial danger, as, when they become commercially valuable, they are gathered in great quantities. The only way of checking this is to refrain from buying.

It is hoped that the love of natural beauty which is encouraged in us by the nature books will lead us one step further, and induce us to pick few flowers instead of many, and to use moderation in breaking large branches of flowering shrubs, which will live in water but a few days, but represent the growth of many years.

This Society urges that we all use

1. **MODERATION.** Do not pick all that you find. Many flowers must be left to develop seeds for future plants.

2. **CARE.** Never pull up the plant, for the roots are of no use in a bunch of flowers, and their destruction means the extinction of the plant. Cut when possible.

3. **JUDGMENT.** Many flowers, such as wild roses, asters, and golden-rod, may be picked with impunity, but when flowers are few or rare do not pick them. Do not pick flowers which must die before you reach home, nor great quantities of those flowers whose grace and beauty are seen better in a few than in many massed together.

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